



# HELLCAT **VS** SHIDEN/SHIDEN-KAI

Pacific Theater 1944–45

TONY HOLMES

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# INTRODUCTION

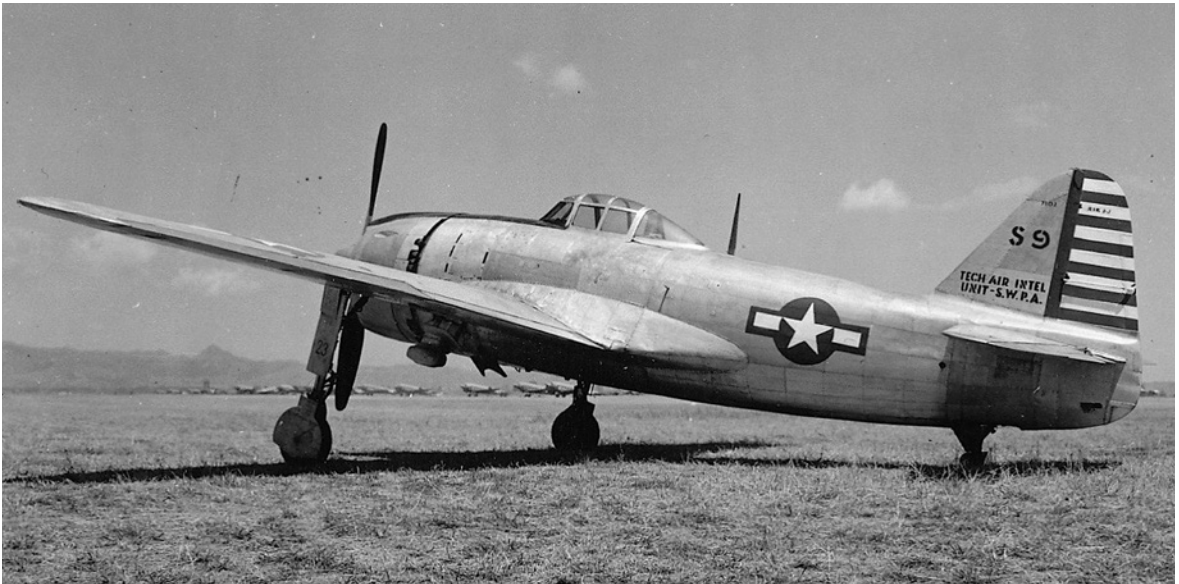
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By the early months of 1945 in the Pacific Theater, the US Navy's burgeoning force of carrier-based F6F-3/5 Hellcats had effectively wiped the skies clear of Japanese fighters in a series of one-sided aerial engagements during a highly successful "island hopping" campaign between 1943 and 1944, as US forces advanced on Japan's Home Islands. The Grumman fighter had proven itself master of the A6M Zero-sen, principal fighter of the Imperial Japanese Naval Air Force (IJNAF) since the surprise attack on Pearl Harbor in December 1941. It had also beaten its replacement, the J2M Raiden, on the few occasions it was encountered during the Philippines Campaign in October 1944.

That same month, however, a new radial-engined fighter was fleetingly engaged over Formosa and the Philippines in a series of bitter actions that resulted in Hellcat units suffering uncharacteristically high losses. They had encountered the N1K1-J Shiden (given the Allied code name "George"), privately developed by Kawanishi from its fast, but flawed, N1K1 Kyofu (Mighty Wind) floatplane fighter. Only a small number were built, and these suffered from engine maladies – a common affliction for late-war Japanese fighters – and chronic undercarriage failures. Indeed, the Shiden's landing gear issues were commented on at length in an intelligence report tabled by the Technical Air Intelligence Unit-South West Pacific (TAIU-SWPA) after it test flew a handful of examples following the liberation of the Philippines:

Other PoWs, as well as the Allied test pilot who flew the rebuilt GEORGE stated that a grass runway was absolutely essential, and that the brakes must be used only when necessary. Of some 60 GEORGES found in Luzon, at least two-thirds had been destroyed or damaged in crashes resulting from landing gear failure. This condition would seem to





preclude GEORGE 11 appearing in large numbers operationally. However, a later low-wing version (GEORGE 21) which has been reported will probably be fitted with stronger gear than the stop-gap design of GEORGE 11.

The “George 21” variant alluded to in this report was in fact the N1K2-J Shiden-Kai, production examples of which had started to reach the newly formed 343rd Kokutai, staffed by combat veterans and charged with defending the Japanese Home Islands, in early January 1945. Kawanishi had lowered the wing position with the N1K2-J, thus reducing the length of the undercarriage legs and eradicating their fragility. Center of gravity problems that had plagued the N1K1-J were rectified by lengthening the fuselage, while redesigned tail surfaces and a revised cowling shape were also adopted.

Between March and August 1945, “George” pilots claimed more than 170 aerial victories over Kyushu and while escorting kamikaze formations sent to attack Allied warships supporting the amphibious assault on Okinawa. A number of these victories were over carrier-based F6Fs, literally hundreds of which flew marauding strikes over Japan from February 1945 through to war’s end. US Navy Hellcat pilots in turn were credited with many of the 100-plus Shiden-Kais downed in the ill-fated defense of Japan.

A small number of 341st Kokutai N1K1-J “George” fighters were discovered in various states of disrepair at Marcott, one of Clark Field’s surrounding satellite sites on Luzon, in January 1945 following its liberation by US Army troops. This “George,” coded S 9, was the second Shiden test flown by the TAIU-SWPA [the first example was coded S 7] during the spring of 1945. (NARA)

# CHRONOLOGY

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## 1940

**September**

Imperial Japanese Navy (IJN) issues 15-Shi specification covering the development of a floatplane fighter for the IJNAF. Kawanishi commences work on the K-20, which would be redesignated N1K1.

## 1941

**June**

US Navy orders two prototypes of the Grumman G-50 as the XF6F-1.

**December**

Kawanishi engineering team proposes to develop a land-based version of the N1K1. Company decides to go ahead with the new aircraft, designated Model X-1 Experimental Land-based Fighter, as a private venture based on estimated performance.

## 1942

**January 7**

US Navy signs a production contract for 1,080 F6F-1 aircraft.

**May 6**

N1K1 Kyofu makes its maiden flight.

**June 26**

XF6F-1 makes its first flight with Wright R-2600 engine.

**July 30**

Revised XF6F-3, fitted with a more powerful Pratt & Whitney R-2800 engine, makes its first flight.

**October 3**

First production F6F-3 completes its maiden flight.

**December 31**

X-1 prototype undertakes its first flight at Itami airport, seven months and three weeks after the first flight of the N1K1.

## 1943

**January**

VF-9 becomes the first US Navy squadron to convert to the F6F-3.

**July**

One of four X-1 prototypes handed over to the IJNAF for evaluation. The IJNAF eventually instructs Kawanishi to proceed with the design, which becomes officially known as the N1K1-J Shiden (Violet Lightning).

**September 6**

Ens James Warren of VF-33, based at Guadalcanal, becomes the first Hellcat pilot to claim an enemy fighter in aerial combat.

**November 15**

The 341st Kokutai is formed at Matsuyama, on the island of Shikoku, to fly the N1K1-J. First examples of the aircraft do not reach the unit until February 1944, however, due to production delays and serviceability issues.

**December 31**

Prototype N1K2-J flown for the first time, Kawanishi regarding this aircraft as its definitive land-based fighter.

## 1944

**April 4**

Grumman commences production of the improved F6F-5, which features the Pratt & Whitney R-2800-10W engine first seen in late-build F6F-3Ns, a flat windscreen that eliminated distortion, deletion of the cockpit's small aft windows and provision for the carrying of additional external fuel tanks and weaponry. The last F6F-3 was completed on April 21.

**June**

Production examples of the N1K2-J Shiden-Kai (Violet Lightning Modified)



**July 4**

begin rolling off the assembly line at Kawanishi's Naruo plant.

VF-2, embarked in USS *Hornet* (CV-12), and VF-13, embarked in USS *Franklin* (CV-13), give the F6F-5 its combat debut during a 60-aircraft carrier sweep of Iwo Jima.

**October 12**

N1K1-J sees combat for the first time when the 401st Hikotai engages F6Fs from Task Force (TF) 38 sent to attack targets on Formosa.

**October 22**

N1K1-Js from the 341st Kokutai and 401st Hikotai are sent to Marcott Field, on Luzon, after US forces landed on Leyte Island 48 hours earlier, signaling the start of the campaign to retake the Philippines.

## **1945**

**January**

First production examples of the N1K2-J begin to reach the newly formed 343rd Kokutai at Matsuyama.

**January 9**

Last four airworthy N1K1-Js in the Philippines are shot down (possibly by F6Fs) over the Lingayen Gulf. Between October 24, 1944 and January 9, 1945, Shidens had flown 303 sorties in the Philippines and claimed more than 40 aerial victories.

**February 16**

During the first Fast Carrier Task Force strikes on the Home Islands, instructor pilots from the Yokosuka Kokutai take the Shiden-Kai into action for the first time when they engage Hellcats from TF 58 and claim several shot down.

**March 19**

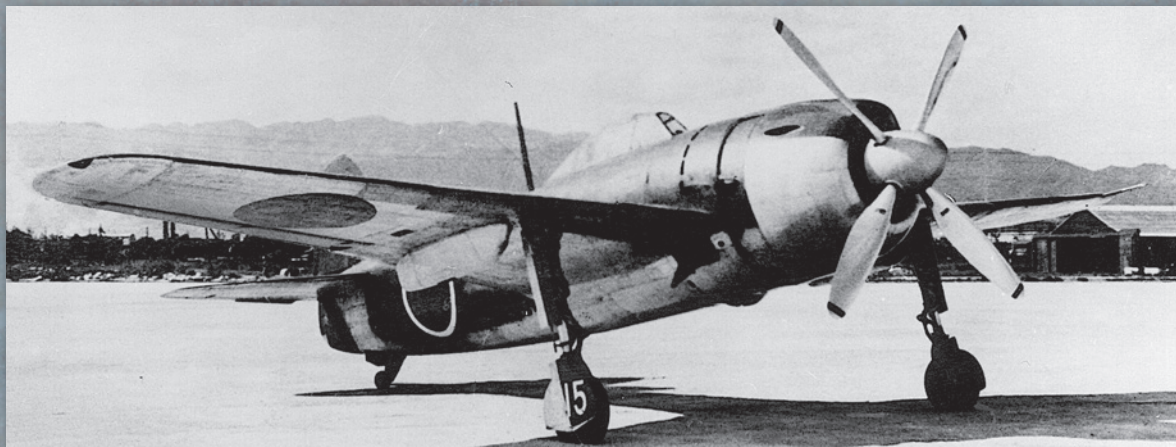
Sixteen TF 58 carriers dispatch more than 300 aircraft (more than half of them F6F-5s) to attack airfields on Kyushu and IJN warships in and around Kure harbor. The 343rd Kokutai makes its combat debut opposing the US Navy strike force.

**April-May**

During Operation *Ten-Go*, the 343rd Kokutai suffers steady losses to US Navy fighters while trying to defend large formations of kamikaze aircraft attempting to attack Allied ships supporting the invasion of Okinawa (Operation *Iceberg*).

**July 24**

N1K2-Js and F6F-5s engage one another in combat for the final time, during a carrier strike by TF 38 against IJN vessels in Kure harbor. More than 500 US Navy aircraft were involved, while the 343rd Kokutai had only 24 serviceable Shiden-Kais available.



Designated X-1 [Experimental Interceptor No. 1] by Kawanishi and, eventually, N1K1-J Shiden by the IJNAF, the Shiden prototype – with Air Arsenal pilot Lt Takumi Hoashi at the controls – made its first flight from Itami airport on December 31, 1942. A total of nine prototypes were built. [Philip Jarrett]

# DESIGN AND DEVELOPMENT

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## F6F HELLCAT

The Hellcat was always destined to be a success, as it embodied improvements introduced after early lessons learned by operators of Grumman's previous fleet fighter, the F4F Wildcat, in the Pacific, as well as general pointers from the RAF's experience engaging the Luftwaffe in 1940. It subsequently proved so effective that legendary British Naval Aviator and test pilot Eric "Winkle" Brown made the following observation in his book *Wings of the Navy*:

No more outstanding example of skill and luck joining forces to produce just the right aeroplane is to be found than that provided by the Grumman Hellcat.

The original design for the Hellcat actually dated back to January 1938, when the Grumman Aircraft Engineering Corporation had discussions with the US Navy's Bureau of Aeronautics, which was searching for a "Wilder Wildcat" to provide better performance than the XF4F-2 that was then being extensively tested prior to entering fleet service. The key to building a superior fighter was horsepower, the Bureau stating that it was interested in future designs fitted with the new and more powerful 1,600hp Wright R-2600 engine – the XF4F-2's Pratt & Whitney R-1830-66 radial was rated at just 1,050hp.

Leroy Grumman duly sent an informal proposal to the Bureau in February 1938 stating that he could provide a re-engined XF4F-2 within 120 days. Company

engineers also noted that modifying the prototype to take the R-2600 “has practically no effect on the external dimensions and appearance of the XF4F-2 airplane.” The Bureau failed to share Grumman’s enthusiasm for the manufacturer’s new design, stating that major airframe modifications would be needed to allow the Wright engine to be successfully fitted to the aircraft.

It believed that landing speeds would be increased beyond acceptable limits due to the heavier gross weight of the R-2600, and this problem could only be rectified through redesigning the wing. The fighter’s center of gravity would also be adversely affected. Finally, the Bureau stated that the larger propeller needed to absorb the greater power of the Wright engine would reduce ground clearance below the US Navy’s requirements if the XF4F-2’s landing gear configuration was retained.

The US Navy eventually chose the XF4U-1 from Chance Vought, powered by the new Pratt & Whitney R-2800 engine, as its future fleet fighter. Unperturbed, Grumman stuck with the idea of a more powerful version of the XF4F, even after it received a contract for production of the revised F4F-3. In September 1940 Grumman presented the Bureau with plans for its Model G-50, essentially an improved F4F with a wider wingspan and lengthened fuselage, powered by the R-2600 engine. Again, citing concerns over the aircraft’s center of gravity, the Bureau also explained to Grumman that “recent developments have led to additional requirements for Class VF [fighter] aircraft which must be met if the airplane in question is to be considered satisfactory for service use.”

Reports from US Navy observers in Europe had convinced the Bureau that it required carrier fighters with higher speed (close to 400mph), greater range (1,500 miles with external drop tanks), heavier armament (six 0.50in. machine guns) and more armor protection. Keen to have other options available aside from the F4U, the Bureau instructed Grumman to rework its G-50 design in light of these new requirements.

Led by chief engineer William T. Schwendler, the design team immediately replaced the fuselage-mounted undercarriage with widely splayed gear legs, housed in the wing stubs and retracting rearward. The wings were also repositioned from a mid- to low-fuselage position. They were also the largest of any World War II single-engined fighter, Allied or Axis, and the resulting low wing loading would give the fighter comparatively slow carrier landing approach speeds. The Bureau had also emphasized good forward and downward vision as one of its new requirements for the revised Grumman fighter. The cockpit was placed high above the low wing, with the G-50’s nose sloping downward to give the pilot an outstanding forward field of view.

Following a US Navy inspection of a mock-up of the new Grumman fighter, the Bureau requested that the fuselage be lengthened by 26in and the wing area increased from 290sq ft to 334sq ft so that more fuel and ammunition could be carried, as well as additional armor protection for the wing-mounted guns.

The unpainted Grumman XF6F-1 prototype around the time of its first flight on June 26, 1942. This aircraft was fitted with a 1,700hp Wright R-2600 Cyclone engine, which failed to provide the performance the US Navy was looking for. [NARA]



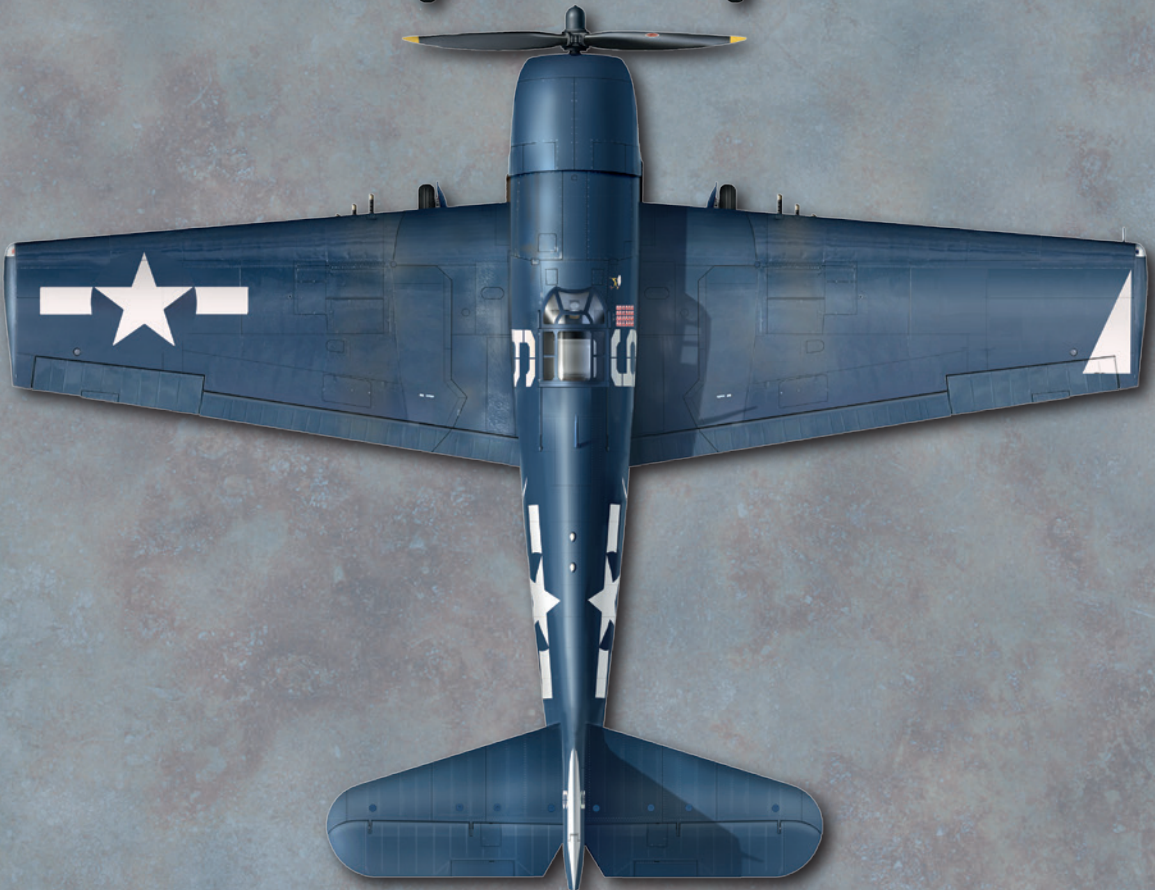


# F6F-5 Hellcat

33ft 7in.



13ft 1in.



42ft 10in.

On June 19, 1941 Grumman received an order from the US Navy for two prototypes (given the military designation XF6F-1) to be powered by the 1,700hp Wright R-2600-10 engine. Within a month of the surprise attack on Pearl Harbor on December 7, the US Navy contracted Grumman to build 1,080 F6F-1s with Wright engines. Grumman test pilot Robert Hall took the XF6F-1 aloft on its maiden flight on June 26, 1942 and subsequently reported that the only problems he had encountered centered on excessive trim changes and longitudinal stability.

Although the XF6F-1's handling was benign – Leroy “Roy” Grumman subsequently claimed the aircraft had been “designed to be flown by 200-hour farm boys” – its performance did not meet the US Navy's requirements in respect to speed and rate of climb. Fearing that this may be the case due to the aircraft being substantially heavier than its F4F progenitor, Grumman engineers had already contemplated replacing the Wright R-2600-10 with the more powerful Pratt & Whitney R-2800 engine specified for the XF4U-1. Indeed, the XF6F-1 airframe had been designed in such a way that it could easily take the physically larger 18-cylinder unit if required.

Grumman engineer Leon A. “Jake” Swirbul had flown to Hawaii in June 1942, soon after the Battle of Midway, where he had a long meeting with Cdr John S. “Jimmy” Thach, the Wildcat ace who developed the famous “Thach Weave defensive maneuver.” He confirmed that the replacement fighter for the Wildcat needed a more powerful engine than the 1,700hp R-2600. Grumman was duly instructed to equip the second XF6F-1 with the R-2800-10 and a Curtiss Electric propeller and spinner. Designated XF6F-3, the aircraft made its first flight barely a month after the XF6F-1, on July 30, 1942. Reports from test pilots that flew the re-engined fighter confirmed that the US Navy had made the correct decision to replace the Wright radial with the Pratt & Whitney.

The first production F6F-3 made its maiden flight on October 3, 1942 – just nine weeks after the R-2800-powered second prototype XF6F-3 had flown for the first time. This was because only a handful of minor changes had been needed to turn the XF6F-3 into the production model F6F-3. These included simplification of the undercarriage covers, deletion of the propeller spinner and replacement of the Curtiss Electric propeller with a Hamilton Standard Hydromatic constant-speed unit.

Grumman had delivered more than 1,000 F6F-3s before the aircraft finally received a name. It was generally referred to at the company's Bethpage works during this time as the “Super Wildcat.” “Tomcat” had also been proposed, although this was deemed to be too risqué in 1942! Roy Grumman himself eventually chose the name “Hellcat.”

VF-9 became the first US Navy squadron to receive the F6F-3, in January 1943, with other fleet fighter squadrons replacing their F4Fs or being newly established with the Hellcat as rapidly as Grumman could build the new aircraft. The US Navy had 263 Hellcats on strength by early July, equipping

## OPPOSITE

This unidentified F6F-5 of VF-9, embarked in USS *Yorktown* (CV-10), was used as a backdrop for a series of photographs taken in June 1945 as the vessel made its way back to the Philippines after the end of Carrier Air Group Nine's combat tour. High-scoring pilot Lt Eugene Valencia and the members of his division – fellow aces Lt(jg)s Harris Mitchell, Jim French and Clinton Smith – posed for a number of publicity photographs sat on or standing in front of this Hellcat while holding a panel showing their combined total of 50 victories. The squadron added 23 Japanese flags victories beneath the cockpit of the F6F-5, these denoting Eugene Valencia's final score. Although none of these Naval Aviators claimed a “George” kill, they were credited with 14.5 “Frank” victories and a handful of “Tojos,” so it is highly likely that some of these successes were Shiden-Kais.

The F6F-3 production line at Grumman's Bethpage, New York, factory in February 1943. The company completed just 35 Hellcats that month as production of the new fleet fighter slowly ramped up, but by December 1943 it had delivered 458. Throughout 1944, Grumman churned out an average of 500-plus F6Fs per month. (NARA)







VF-9 CO Lt Cdr Jack Raby made the first Hellcat landing on board USS *Essex* (CV-9) on February 17, 1943 in this brand new F6F-3. Several weeks earlier, his unit had become the first fleet squadron to receive the Grumman fighter. Firmly tied down to the flight deck and with wheel chocks in place, the aircraft is being refueled in preparation for its next training flight. (NARA)

13 squadrons. The rapid rate at which the F6F was delivered reflected its simple, straightforward design as per Grumman's World War II credo – "Make it strong, make it work and make it simple." These attributes were greatly appreciated by the US Navy, which had by then found to its disappointment that the F4U-1 Corsair, despite possessing a better rate of climb and being considerably faster at altitude than the F6F-3, had poor deck-landing characteristics due to the pilot's limited visibility over the nose and alarming stalling characteristics at low speeds.

These problems, which were eventually cured, reflected the fact that Chance Vought and Grumman had taken different approaches to the challenge of developing a US Navy fighter. The Corsair had been built with maximum performance almost exclusively in mind – hence it was more expensive than the F6F (the US Navy could buy five F6Fs for the price of three F4Us) and possessed challenging handling qualities, particularly on approach to a carrier. The Hellcat, on the other hand, was designed with ease of manufacture in mind. Thanks to the R-2800 engine, it also had good – but not stellar – performance. Critically for the US Navy, it had benign carrier-landing characteristics. Whereas the Corsair could be unforgiving to fly if handled incorrectly, the Hellcat was relatively easy. With the US Navy's training command now producing thousands of young ensign pilots, the F6F's civility "around the boat" was proving to be of primary importance.

With this firmly in mind, the US Navy made the decision as early as September 1942 that the Corsair would not be suitable as a carrier fighter. Three months later, USS *Essex* (CV-9) – the first of 14 such vessels in a new class of fleet carrier that would play a key role in the Allied victory in the Pacific War – was commissioned. In January 1943 the light carrier USS *Independence* (CVL-22) also entered service as lead ship in a nine-strong class that used *Cleveland*-class light cruiser hulls.

The US Navy urgently needed aircraft to equip the carrier air groups that would be embarked in these ships. Better fighters were top of the list, as the safety of these carriers would rely on squadrons achieving air superiority over the IJNAF's improved Zero-sen and then downing enemy dive- and torpedo-bombers sent to attack the carrier task groups. Fortunately for the US Navy, the Hellcat was available when it was most needed. Not only did it prove considerably easier to land on a carrier than the Corsair, it also had the performance to beat the Zero-sen in aerial combat when flown to its strengths.



Grumman commenced production of the F6F-5 at its Bethpage factory on April 4, 1944, the "Dash Five" incorporating a number of refinements tested on the F6F-3 and F6F-3N. With the R-2800-10W engine, which used water injection, the F6F-5 had a maximum speed of 380mph. The last "Dash 3" Hellcat rolled off the factory floor on April 21, 1944. [NARA]

Grumman shifted production from the F6F-3 to the F6F-5 during the course of April 1944. It had completed 4,402 -3s by the time the last one rolled off the line on the 21st – 16 days after the first -5 had been built. The two aircraft were so similar that there was no prototype F6F-5, the latter aircraft incorporating a number of minor modifications following feedback from frontline units. To improve speed, the R-2800-10W, with water-methanol injection, was fitted as standard; water-methanol injection could increase the engine's power output to 2,200hp for brief periods. The improved powerplant had equipped 60 percent of the -3s built from January 1944, and by April Pratt & Whitney was delivering enough R-2800-10Ws for Grumman to install them in all Hellcats.

The F6F-5 also featured a more streamlined engine cowling in an attempt to further increase its top speed (it was capable of 386mph, which compared rather poorly with the F4U-4's maximum of 452mph). More importantly, Grumman did its best to improve the F6F-3's excessive longitudinal stability. Thanks to its large size and ample wing area, the Hellcat was reluctant to turn. Indeed, pilots reported that the F6F-3's ailerons were tiringly heavy to operate and ineffectual at high speeds. The addition of aileron spring tabs went a long way to curing the problem on the F6F-5, improving roll rate at speeds above 200mph. The aircraft's bomb-carrying capabilities were also expanded, reflecting its increased use as a fighter-bomber as Japanese air power in the Pacific waned.

Grumman went on to complete 7,868 F6F-5 Hellcats before the end of the war. By the time the last Hellcat rolled off the production line in November 1945, the company had built 12,275 F6F-3/5s in just 30 months, representing an average of more than 16 aircraft a day during a six-day working week. When production was at its peak, Grumman completed a Hellcat every hour. This is a record that has never been equaled. The company's workforce (which was so devoted to Grumman that it had the lowest personnel turnover rate of any North American aircraft company in World War II) built so many F6Fs that the US Navy had to ask it to slow down. When a rumor went around the plant that Grumman was going to make workers redundant because the US Navy no longer needed so many Hellcats, employees increased their productivity in an attempt to prove that they did not deserve to lose their jobs. A new monthly production record was set as a result.

## N1K1-J SHIDEN/N1K2-J SHIDEN-KAI

In June 1944 the IJNAF decided that the myriad problems afflicting the Mitsubishi J2M Raiden would prevent it fulfilling the 14-Shi specification issued to the company prewar. It had called for the development of a fighter capable of achieving a maximum speed of 373mph at 19,685ft, the ability to attain this altitude within 5.5 minutes of take-off and an endurance of 45 minutes at full power. The aircraft was to have a take-off run at overload weight in nil-wind conditions not exceeding 985ft and a landing speed no greater than 81mph. Armament would consist of two 20mm cannon and two 7.7mm machine guns (as fitted to the A6M2 Zero-sen) and, for the first time, armor protection was requested for the pilot, in the form of plating behind the seat.

By the summer of 1944 the Raiden was clearly all but a lost cause. Fortunately for the IJNAF, a new, faster, and more reliable interceptor was on the cusp of entering frontline service. The Kawanishi N1K2-J Shiden-Kai ultimately proved effective as an interceptor, although it too suffered poor mechanical reliability and paucity in numbers.

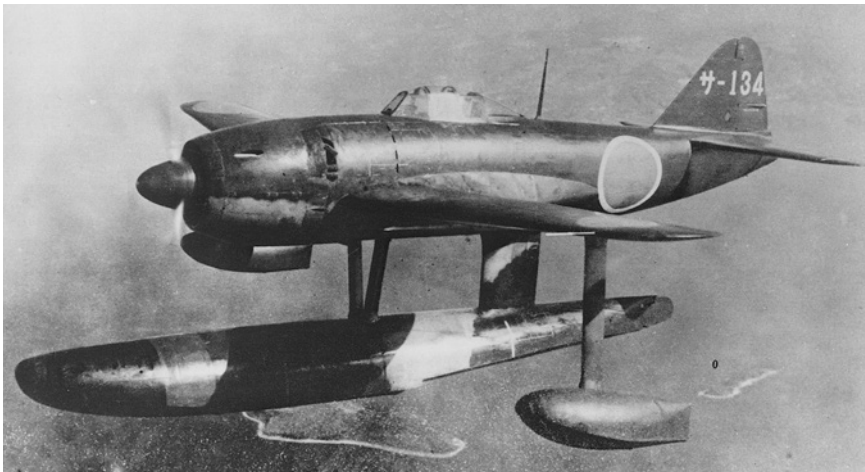
Unlike Mitsubishi, Nakajima and Kawasaki, Kawanishi had very little experience in building fighter aircraft, the company specializing instead in large, long-range flying boats including the H6K and H8K. In an ironic twist of fate, Kawanishi's affinity with waterborne aircraft eventually led it to produce one of the war's finest land-based piston-engined fighters. Both the Shiden and its lineal descendent, the Shiden-Kai, owed their existence to the N1K1 Kyofu.

Development of the latter was prompted by an IJNAF request in 1940 for a floatplane fighter to support Japanese amphibious landing forces in areas where there was no adjacent airfield for land-based fighters. While Nakajima undertook development of an interim aircraft (the A6M2-N, derived from the Zero-sen), Kawanishi was instructed to design an all-new airplane. The IJN issued the 15-Shi specification covering this aircraft in September 1940 and planning immediately commenced at Kawanishi.

By then, the company had been working on the ultimately unsuccessful E15K Shiun (Violet Cloud) advanced reconnaissance seaplane for more than a year, and it

employed some of the advanced technology incorporated in this aircraft – laminar-flow wings, contra-rotating, two-bladed propellers to negate torque on take-off, and a 1,460hp Mitsubishi MK4D Kasei (Mars) 14 radial engine – in the new fighter. Designated K-20 under the Service Aeroplane Development Program system and N1K1 Kyofu

Kawanishi built just 97 N1K1 Kyofu floatplane fighters, this number including eight prototypes and service trials aircraft. When peak production was reached in December 1943, the company was delivering just 15 Kyofus per month. This Sasebo Kokutai (adorned with a Katakana "SA" for Sasebo, as part of its aircraft code) was photographed over Kyushu in September 1944. (Philip Jarrett)





by Kawanishi, the comparatively heavy, all-metal mid-wing monoplane had a single central float attached to the fuselage by a V-strut forward and an I-strut at the rear. Retractable stabilizing floats near the wingtips (similar to those installed in the Shiun) were initially proposed, but replaced by fixed cantilever floats when the former encountered difficulties in the E15K's early flight trials.

Following its completion at Kawanishi's Naruo plant, the first of eight prototype/service trials N1K1s made its maiden flight on May 6, 1942. Teething troubles with the gearbox for the contra-rotating propellers (a problem that previously blighted the Shiun program) quickly saw the MK4D Kasei Model 14 engine replaced with a 1,530hp MK4C Kasei Model 13 driving a conventional three-bladed propeller via an extension shaft. The Kasei Model 13-powered second prototype was delivered shortly thereafter, and although the new engine/propeller combination was more reliable, the powerful on-water torque generated on take-off meant that only the most skilled pilots could fly the Kyofu.

Nevertheless, service trials aircraft were handed over to the IJNAF from August 1942, the fighter being rated as extremely pleasant to fly. Pilots were particularly impressed by the Kyofu's outstanding maneuverability, thanks to its combat flaps. The N1K1 was armed with two wing-mounted 20mm cannon and two fuselage-mounted 7.7mm machine guns.

The Kyofu was ordered into quantity production in the autumn of 1942 and deliveries began in the spring of 1943. However, production was slow to gain momentum and by December 1943, when the delivery rate had reached 15 aircraft per month, the IJNAF took the decision to cease manufacturing the N1K1 – the last of just 97 Kyofus, including eight prototypes and service trials aircraft, was delivered in March 1944. The halting of production in favor of the land-based N1K1-J Shiden reflected the fact that Japan no longer had the upper hand in the Pacific War, hence the IJNAF had no need for a fighter designed to support offensive operations. A land-based interceptor capable of defending the Home Islands was now the priority, and Kawanishi believed it had just the fighter for the job.

In December 1941, while detailed design work was still being carried out on the N1K1, the Kawanishi engineering team briefed its management on a land-based Kyofu derivative. The aircraft's projected performance was sufficient to convince Kawanishi to develop the machine privately. By the end of the year it had submitted a proposal for the

This view of a prototype N1K1-J (nine were built) shows just how similar the Shiden and Kyofu were, particularly in respect to the generously proportioned fuselage and mid-mounted wings. Painted in prototype orange/yellow overall as per IJNAF regulations, the aircraft was photographed at Itami airfield in January 1943. (Philip Jarrett)



fighter to IJNAF headquarters, and its Technical Director for Aircraft, Vice Admiral Rikizo Tada, was impressed enough by what he saw to give the design his blessing. Although no official specifications were subsequently issued, Kawanishi believed that if it built a fighter better than those either in service or under development, the IJNAF would buy it. The company appointed Shizuo Kikuhara to head the engineering team, while the IJNAF assigned Engineering Cdr Junjiro Suzuki to offer guidance.

Initially, with the exception of the replacement of the ventral float and outrigger floats by a fully retractable, wheeled undercarriage, few modifications to the Kyofu were planned. However, it was soon decided to replace the 14-cylinder MK4D Kasei 14 engine with the new 18-cylinder Nakajima NK9B Homare (Honor) 11 radial, which was expected to produce more than 1,800hp – the Homare was based on Nakajima's successful 14-cylinder NK1C Sakae (Prosperity) 12, fitted to the A6M2.

To take full advantage of all this power, a VDM four-bladed propeller, with a diameter of almost 11ft, was selected. The propeller's large diameter, combined with the location of the wings at mid-fuselage, meant the adoption of lengthy and complex undercarriage legs that contracted as they retracted into the wing wells – for landing, the process was reversed. Modifications were also made to the combat flap system, which was changed from manual control in the Kyofu to automatic extension/retraction in the new land-based fighter.

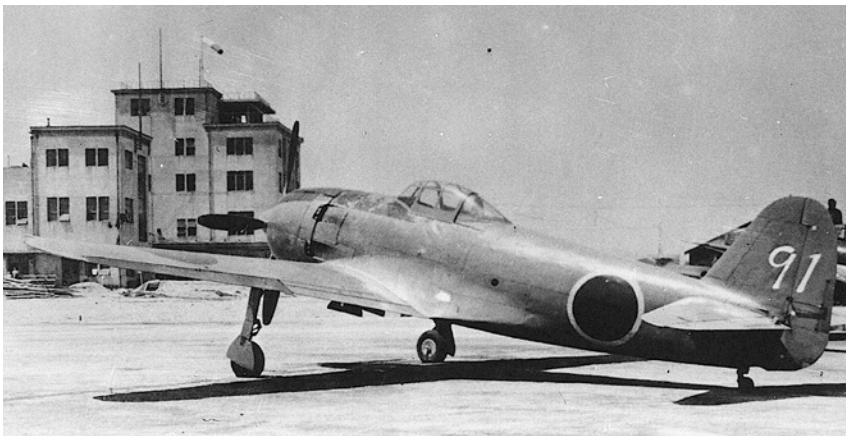
Despite the landing gear presenting problems to the design team, construction of the prototype progressed rapidly at the Naruo plant. Designated X-1 (Experimental Interceptor No. 1) by Kawanishi and, eventually, N1K1-J Shiden by the IJNAF, the prototype – with Air Arsenal pilot Lt Takumi Hoashi at the controls – made its first flight from Itami airport on December 31, 1942.

As with the Raiden, the Shiden was afflicted by numerous problems during its flight trials program. The Homare engine failed to produce the power hoped for – the prototype's top speed was initially 357mph, whereas its maximum speed had been estimated at 403mph – primarily because of poor fuel quality and unreliable carburetors. Hoashi also complained about poor visibility from the cockpit during taxiing owing to the length of the undercarriage, which also quickly proved unsuitable for unpaved runways. Finally, the fighter suffered from excessive propeller torque on take-off.

However, once in the air, the aircraft was a revelation thanks to the combat flap

system it inherited from the Kyofu. A Japanese innovation, it was unique to Kawanishi's late-war fighters. When flying a Zero-sen in aerial combat, the pilot had to manually engage the flaps. If he banked his fighter sharply to the left to instigate a turn without having correctly engaged the flaps, the aircraft would instead bank violently to the right.

The prototype N1K2-J completed its first flight from the newly constructed Naruo airfield on December 31, 1943, with Kawanishi test pilot Munekichi Okayasu at the controls. Also painted orange/yellow overall as per IJNAF regulations, it is seen here on the Naruo flightline wearing the production number "91" in white on its tail. Production aircraft differed very little from this machine, with only the cowling and exhaust stubs being altered. The first 100 N1K2-Js also had the larger tail as seen here, with all subsequent examples having a vertical stabilizer 13 percent smaller in area. (Philip Jarrett)



This was because the right wing had stalled due to the greatly increased angle of incidence associated with the turn. The combat flaps in the N1K1, however, lowered automatically at a steady rate when the fighter started to maneuver, enabling the pilot to make a sharp turn without having to exert a heavy force on the control column, endure high g-force or cause the airplane to stall. On June 5, 1943, a mock dogfight between the original Shiden prototype, which lacked the flaps, and a newly built aircraft with them installed saw the latter dominate the engagement.

Nevertheless, IJNAF personnel (both pilots and engineers) remained unhappy with the Shiden, principally because it had been developed privately by Kawanishi without their direct input. Yet even with the reduced performance of its engine, the N1K1 was faster than the A6M5 that then equipped frontline units, and the J2M2, which was on the cusp of operational service. It also had greater range and was more maneuverable than the Raiden. With Corsairs and Hellcats now appearing in the Pacific Theater, the IJNAF knew it had to stick with the Shiden.

Kawanishi subsequently improved the aircraft with the help of service engineers and technicians, installing the more reliable 1,990hp NK9H Homare 21, enclosed in a modified cowling featuring an additional lower lip scoop, individual exhaust stacks and an external oil cooler to port. Armament was increased with two additional 20mm Type 99 Model 2 cannon installed in the wings outboard of the gondola-housed 20mm weapons originally fitted to the prototype N1K1 (both variants retained the fuselage mounted 7.7mm Type 97 machine guns).

By the end of 1943, Kawanishi's Naruo plant had built 70 N1K1-Js and a first example had also rolled off the line at Himeji. Ultimately, 539 Shidens (prototypes and production aircraft) were completed at Naruo and 468 at Himeji. Despite ongoing engine reliability and undercarriage problems stemming from low-grade fuel, poor machine tooling and inferior-quality materials, they began reaching the frontline in early 1944.

Just four days after the N1K1-J's first flight in X-1 prototype form, Kawanishi's design team commenced work on an advanced version of the aircraft. The Shiden was subsequently seen as a stopgap fighter pending availability of the N1K2-J, christened Shiden-Kai. Keen to eliminate the need for the long, complex and troublesome undercarriage, and hoping to simplify construction and maintenance, Kawanishi moved the wings to the lower fuselage, adopted conventional landing gear and entirely redesigned the fuselage and tail surfaces. The end result was a virtually new aircraft that retained only the wings and cannon armament of the N1K1-J (all four 20mm weapons were now installed within the wings, however).

The prototype N1K2-J completed its first flight from the newly constructed Naruo airfield on December 31, 1943, with Kawanishi test pilot Munekichi Okayasu at the controls. A week later, Air Arsenal pilot Lt Yoshio Shiga took the airplane aloft for the first time:



The son of an admiral and a former surface ship officer, Lt Cdr Yoshio Shiga switched to the IJNAF in 1936 and claimed four Soviet aircraft shot down over China in 1939. A veteran of the Pearl Harbor attack, he became an Air Arsenal test pilot in 1942 and was among the first Naval Aviators to fly the Shiden-Kai. Indeed, when the 343rd was formed, there was no other pilot in the IJNAF as familiar with the N1K2-J as Shiga, who became its executive officer. [Author's collection]



This small-tail N1K2-Ja was found in the Showa factory at Shinonoi in late 1945, Kawanishi having sent it to the facility as an instructional aid. Showa had been contracted to build Shiden-Kais for the IJNAF, but none were completed there prior to VJ Day. Behind it is the fuselage of an L2D4-1 "Tabby" transport aircraft. (NARA)

#### OPPOSITE

Shiden-Kai "343-A-15" of the 343rd Kokutai's Sento 301st Hikotai was chosen by Lt Naoshi Kanno as his personnel aircraft when the unit was still based at Matsuyama airfield in March 1945. CO of the 301st, Kanno had this aircraft specially marked with command stripes in the hope that they would attract the attention of enemy airplanes. The chalked "15" within the fuselage hinomaru had been applied by the 343rd for identification purposes during the unit's pre-combat training phase in February–March 1945.

It was a test flight under limited conditions. There were still problems with the engine and propeller. At an altitude of 3000m there was no problem with stability in either direction, even when the landing gear and flaps were down. Stall came abruptly – this was different from the Zero-sen fighter. Visibility was okay. There was no problem with the tailplanes or rudder. The Shiden-Kai was totally different to fly than the Shiden. I signaled to observers on the ground that the aircraft was fine to fly by carrying out a shallow dive towards the runway and then making a short-turn landing after pulling up at low altitude.

Although the Shiden-Kai was a handful near the stall (pilots had to be sensitive with the flight controls, as being rough with the aircraft could lead to an autorotation spin that was hard to recover from), it was an excellent heavy interceptor that was considerably better than the light Zero-sen fighter. It might not have been sophisticated, but the aircraft's four 20mm cannon were effective.

The performance of the Homare engine continued to be lower than expected, however, principally because the IJNAF was forced to use fuel with a quality rating reduced to 85 octane because it was mixed with oil extracted from pine tree roots, which proved very volatile. Nevertheless, frontline pilots still claimed the Shiden-Kai's performance was good up to around 30,000ft.

Manufacturer's trials of the N1K2-J were completed in just 15 weeks, allowing the fighter to be handed over to the IJNAF in April 1944. The latter demonstrated its confidence in the Shiden-Kai by authorizing quantity production before the completion of service trials. By June 1944 seven additional prototypes had been built, and production aircraft, designated Navy Interceptor Fighter Shiden-Kai Model 21, began rolling off the assembly lines at Naruo. Although seven other plants were also ordered to build N1K2-Js, production fell considerably behind schedule as B-29 raids on key sites led to a shortage of engines and airframes. Ultimately, by VJ Day, just 351 N1K2-Js had been completed by the Naruo plant and 42 by Himeji – it had been hoped to have 2,000 in service by the summer of 1945.



# N1K2-J Shiden-Kai

29ft 11in.



11ft 6in.



36ft 1in.



# TECHNICAL SPECIFICATIONS

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## F6F HELLCAT

### F6F-3

A large aircraft that was taller, longer, and had a greater wingspan than its predecessor, the F4F, the Hellcat was also 60 percent heavier than the Wildcat – the F6F-3's empty weight was 9,042lb, compared to 5,895lb for the F4F-4. During a production life that lasted barely 30 months, the Hellcat was subject to only minor modification. As the first production model to enter fleet service, the F6F-3 was almost identical to the prototype XF6F-3 tested by Grumman during the second half of 1942. Indeed, the only changes made were deletion of the propeller spinner, replacement of the Curtiss Electric propeller with a Hamilton Standard unit, incorporation of a more streamlined cowl and a reduction in the size of the landing gear fairings.

The Hellcat was built in four sections – nose, fuselage, empennage and wing assembly. The nose section held the mounting frame for the Pratt & Whitney R-2800-10 engine and auxiliary equipment. The fuselage structure was of all-metal, stressed skin semi-monocoque construction, built up from flanged ring fuselage frames, with aluminum longerons running the length of the fuselage to provide longitudinal support. Aluminum alloy skinning was flush-riveted over this framework. The fuselage was bolted to the wing center section, with the cockpit placed high over



With his F6F-3 under tension on *Hornet's* bow catapult, just moments away from launching on May 6, 1944, the pilot of this heavily weathered VF-2 Hellcat conducts one last cockpit check before signaling that he is ready for take-off. Note the chipped paint along the leading edges of the wings and cordite staining from the guns, which have clearly been recently fired. [US Navy]

the latter so as to give the pilot the best possible view over the nose. The metal empennage was attached to the rear of the fuselage assembly. The rudder and elevators were of fabric-covered aluminum framing. The empennage housed the retractable tailwheel and arrestor hook.

The wing assembly comprised five sections and was mounted in a low-mid position on the fuselage. The center section, attached directly to the fuselage, held the two main fuel tanks. Two stub sections, attached to either side of the center section, housed the rearward-retracting landing gear and carried attachment points for the folding outer wing sections. The detachable outer wing sections contained the Hellcat's armament and could be manually folded aft to lay alongside the fuselage. When spread forward, the outer wing sections were locked in place with hydraulically operated locking pins controlled by the pilot.

The wing center section was built around two cantilever beams, with the wing-fold mechanism attached to the forward beam. The wing stubs and the outer wing sections continued the two-beam structure, with a third beam aft for the attachment of the ailerons and flap assemblies. The beams, ribs and bulkheads were all of metal construction, while the ailerons and outboard flaps were fabric over metal framing.

A VF-9 pilot waits in the cockpit while his Hellcat is rearmed and refueled on board *Essex* in preparation for the next strike on Roi on January 29, 1944. The Hellcat's six 0.50in. Browning M-2 machine guns were mounted in the outer wing sections, staggered to ease the ammunition feed to the guns and provide storage space for the metal ammunition boxes. The latter contained 400 rounds per gun. [NARA]



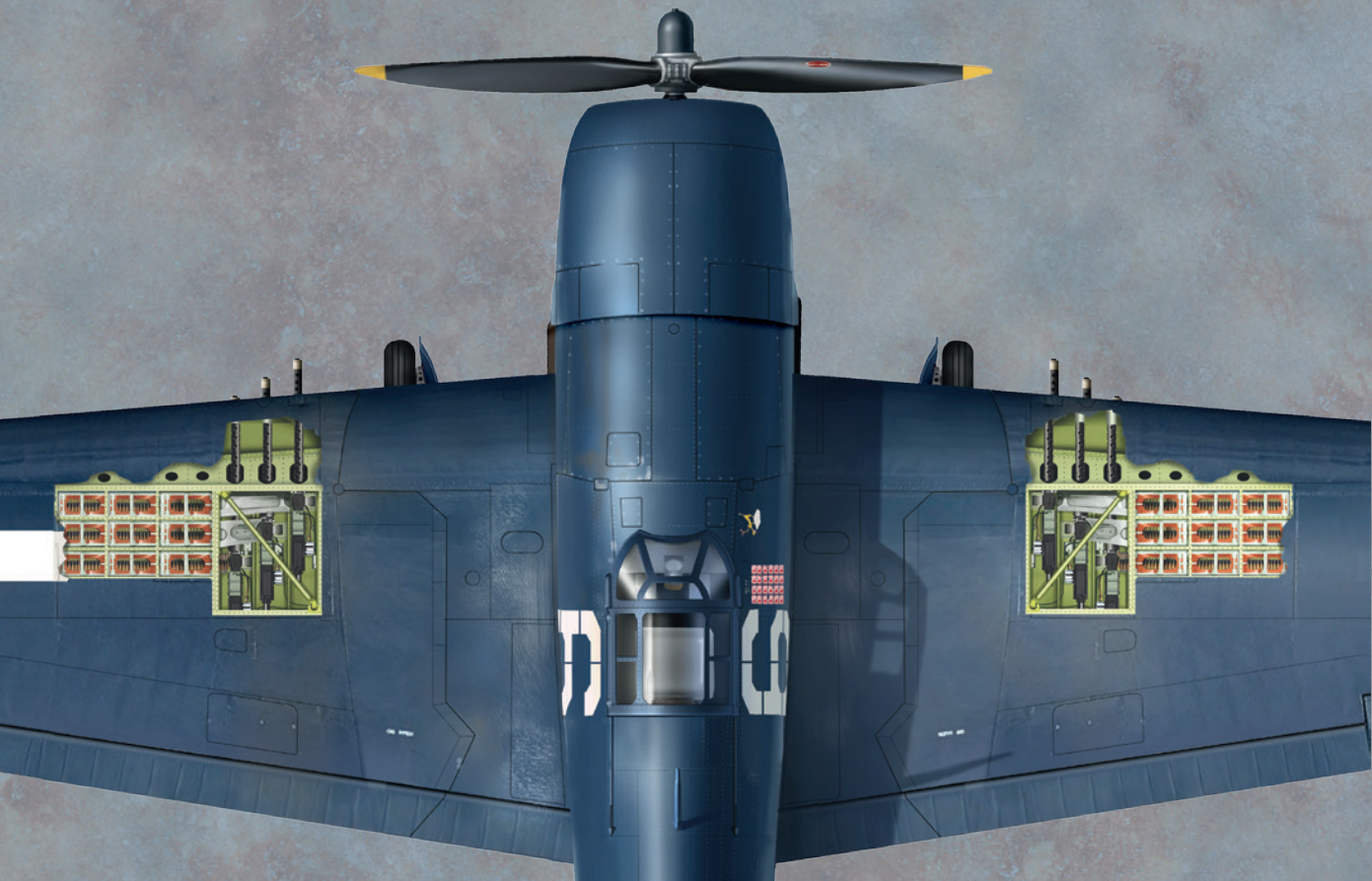
Apart from its more powerful engine and greater size and strength, where the Hellcat differed markedly from its Japanese contemporaries was in its armament and armor protection. While the US Navy had considered an armament of four 20mm cannon, it chose a battery of six 0.50in. machine guns as the standard armament of its new fighters, the XF4U and the XF6E, and the F4F-4 version of the Wildcat. Although the 0.50in. Browning M-2 machine gun was not as powerful as the 20mm cannon, it was highly reliable. Furthermore, standardization with the other US military services enabled greater rates of production and simpler logistics.

The Browning M-2 fired a cartridge with a higher muzzle velocity than the 20mm Type 99-2 cannon fitted in the Shiden and Shiden-Kai, giving long range and penetrative power more than adequate for downing the lightly-built Japanese opponent. The M-2 also had a higher rate of fire than the Type 99-2. Finally, the battery of six 0.50in. machine guns also gave Hellcat pilots the added benefit of not having to cope with different shell trajectories.

## F6F-3/5 HELLCAT MACHINE GUNS

The Hellcat's six 0.50in. Browning M-2 machine guns were mounted in the outer wing sections, and they were staggered so as to ease the ammunition feed to the guns and provide storage space for the metal ammunition boxes. The latter contained 400 rounds per gun. The weapons could

be reloaded from underneath the wing when the outer wings were folded up against the fuselage. The gun compartments were electrically heated, and the guns charged with charging handles in the cockpit. A Mk 8 electric gunsight was mounted on the combing above the instrument panel.





The Hellcat had extensive protection, weighing 221lb, for the pilot, fuel and oil. The pilot's headrest was attached to a face-hardened sheet of armor plate to protect his head and shoulders. To guard against attacks from the front, a sheet of armor plating bracketed the oil tank just ahead of the instrument panel, and a pane of bullet-resistant glass was installed in the windscreen. The two 87-gallon fuel tanks in the center wing section were self-sealing, as was the 60-gallon fuel tank fitted immediately beneath the cockpit. The 19-gallon oil tank located behind the engine had a section of armor plate in front of it for protection against head-on attacks. Another sheet of armor plate protected the oil cooler ahead of the R-2800 engine.

The Hellcat's ability to absorb punishment and still stay aloft soon earned it an enviable reputation in the Pacific Fleet, with two Naval Aviators writing in combat reports, "Mostly holes where the airplane used to be," and "More air going through it than around it." One squadron noted that it had an F6F-3 safely land back aboard a carrier despite having been holed more than 200 times by enemy rounds.

## F6F-5

The F6F-5 Hellcat incorporated modifications tested on the F6F-3. In the late production models of the "Dash Three," Grumman switched to the 2,200hp R-2800-10W engine. With water-methanol injection, the -10W version gave a useful, brief boost in power. Fitted to more than half the F6F-3s built from January 1944, the engine became standard on the F6F-5. A redesigned and more streamlined engine cowlings helped boost the F6F-5's top speed to 380mph at 23,400ft. To improve maneuverability at high speeds, where the Hellcat's controls tightened up, Grumman added spring tabs to the ailerons, making the left-hand aileron tab adjustable from the cockpit. Following tests on an F6F-3, Grumman strengthened the rear fuselage structure and horizontal stabilizers to correct weakness that had appeared in the "Dash Three," incorporating these changes into the F6F-5 and allowing pilots to dive at higher speeds and make more violent pull-outs in combat.

The F6F-5 featured several changes in armament. By early 1944, Pacific carrier squadrons had begun using the F6F-3 as a fighter-bomber, with a bomb adapter on the right wing stub capable of carrying a weapon up to 1,000lb in weight – the aircraft also had provision for a centerline fuel tank. The F6F-5 had fittings for racks beneath both wing stubs, each cleared for the carriage of a 1,000lb bomb, and retained the plumbing for a centerline fuel tank.

No fewer than 36 VF-12 and VBF-12 F6F-5s dominate the flight deck of USS *Randolph* (CV-15) during *Iceberg* operations in April–May 1945. Spotted in the right corner are eight VT-12 TBM-3 Avengers, Carrier Air Group 12 also including VB-12 SB2C Helldivers. Both this unit and VT-12 were each assigned 18 aircraft, while the two fighter squadrons boasted 36 Hellcats apiece. (NARA)



Three Mk 5 zero-length rocket launchers were attached to each outer wing, enabling six 5in. high-velocity aircraft rockets to supplement the bomb load.

At the US Navy's instigation, Grumman trialed a four 20mm cannon fit in the XF6F-4 prototype, in lieu of the standard six machine guns. The arrangement proved workable, but the US Navy decided to retain the 0.50in. machine guns as the F6F-5's main armament, although provision was made for a 20mm cannon to be substituted for the innermost machine gun in each wing. This became the standard armament for the F6F-5N – the dedicated nightfighter version of the Hellcat.

Several improvements in the cockpit incorporated changes developed for the F6F-3N. The F6F-5 featured red instrument panel lighting for improved night flying, a modified windscreen with a flat bullet-resistant glass panel and elimination of the two metal braces on the F6F-3 for better visibility, and a larger sheet of armor plate just behind the pilot's seat. This provided improved protection from aft attacks in a zone roughly 40 degrees wide and 25 degrees tall.

Rearward visibility was a problem never resolved on the Hellcat, however. The first 1,000 or so production F6F-5s retained the two side windows aft of the cockpit, but in subsequent aircraft these were removed. Grumman tested a free-blown canopy that proved successful at moderate speeds, but on a later test flight it disintegrated when the Hellcat was flying at 200mph and the effort was apparently abandoned.

The gondola-mounted 20mm Type 99 Model 2 cannon, fitted beneath the port wing of a Shiden found at Marcott by US forces. The muzzle for the wing-mounted weapon can be seen directly above it. This N1K1 variant was built in larger numbers than any other model. The Shiden's exceptionally long and exceedingly fragile undercarriage is also prominent from this angle. [NARA]

## N1K1/2 SHIDEN/SHIDEN-KAI

### N1K1/2

The following explanation of the fighter's structure and performance is taken from the Division of Naval Intelligence's *Technical Air Intelligence Center Summary No. 33*, published in July 1945. Five months earlier, US Army troops had found a handful of N1K1-Js abandoned by retreating Japanese forces at Clark Field, in the Philippines.

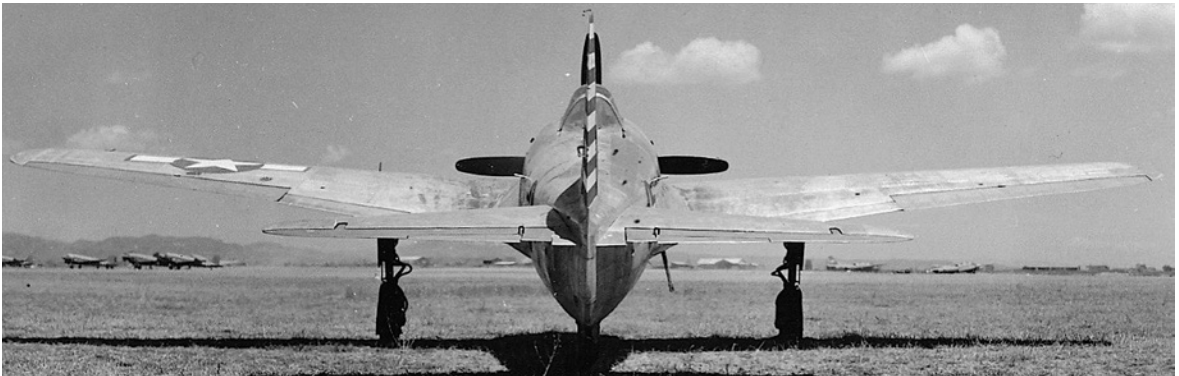
At least two of these were restored to airworthiness by the TAIU-SWPA and briefly test flown, with the results of these flights and detailed, ground-based airframe analysis published in *Summary No. 33*:

#### PRELIMINARY FLIGHT TEST

GEORGE was flown by an Allied field officer after it had been assembled and repaired by the Technical Air Intelligence Unit at Clark Field. One flight was made for a total of one hour and forty-five minutes. The main purpose of the flight was to make the initial check and get the airplane in mechanical condition for tactical trials. The airplane was in excellent shape mechanically, except for the brakes, but was slightly left







wing heavy. The right oleo leg collapsed at the end of the landing roll, and the aircraft was badly damaged. In connection with this, it is of interest that a PoW stated there has been considerable difficulty with the landing gear in particular, and that this may have been the result of trying to convert GEORGE from a floatplane into a land plane.

Conclusions: Excellent take-off, climb, high speed and good vision, but does not impress the pilot with that feeling of confidence which one normally gets in a good, substantial airplane.

Its favorable features are: (1) good vision; (2) good stability; (3) good take-off qualities; (4) good performance; (5) good instrument layout; (6) automatic propeller throttle control; (7) high diving speed; (8) improved rudder and elevator control on approach and landing.

Its unfavorable features are: (1) poor stalling and accelerated stalling characteristics; (2) brakes and rudder brake action; (3) weak landing gear; (4) complicated gear and flap system; (5) poorly balanced controls; (6) heavy ailerons at high speed.

## FUSELAGE

Semi-monocoque construction, skin material of SDCH [Super Duraluminum Clad, H, which denotes that the skinning was water-cooled after tempering at 500° Celsius, cured at a normal temperature and then bent into shape] aluminum with lap joints. Cockpit canopy is high and narrow with good all-round vision. Cockpit layout is generally good. Instruments are well grouped and all cranks and handles are readily available and easy to operate with the exception of the landing gear and wing flap controls. Fuselage is quite deep aft to tail cone, creating for GEORGE an unusual and distinctive appearance in side aspect.

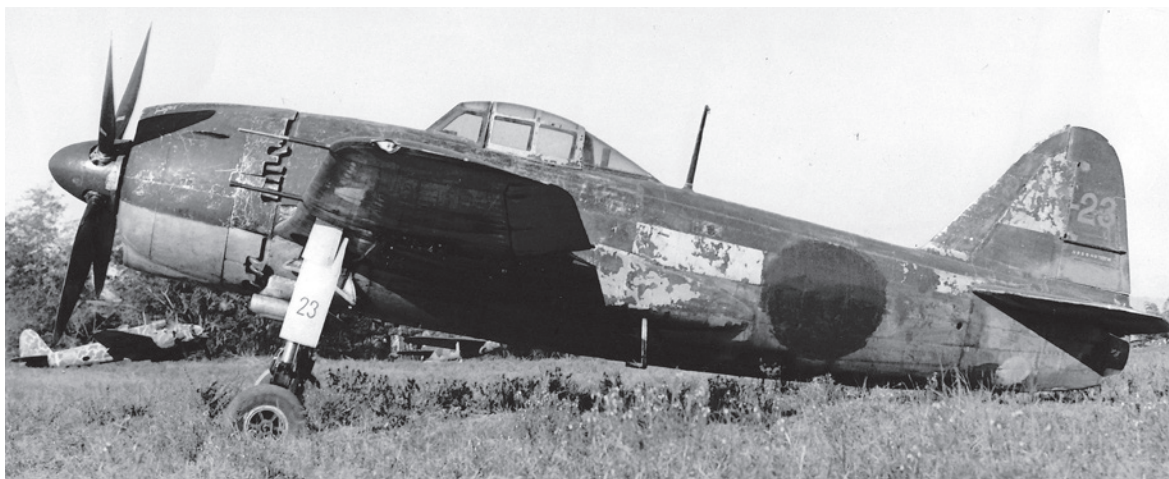
## WING

Low mid-wing with tapered leading and trailing edges terminating in rounded tips. Center portion of wing is integral with the fuselage, and an outer panel is attached to the center section. Two-spar construction, with one spar full span, while the other extends only to the outer panel. The central wing section had three ribs on either side of the fuselage and each outer panel is constructed with nine ribs

Ailerons are of conventional fabric and metal design, with ground-adjustable trim tabs.

Flaps are Fowler type, hydraulically actuated, with an angular travel of 30°. There are two hydraulic cylinders per flap. An automatic maneuver flap was installed in the original

The second aircraft flown by the TAIU-SWPA (the first was coded S 7), S 9 completed a handful of flights during the spring of 1945. The N1K1-J's oval-shaped fuselage and mid-mounted wings were two of the key recognition features for Hellcat pilots engaging it in combat. [US National Archives at College Park, MD, Still Pictures Branch]



Of the handful of 341st Kokutai N1K1-Js found at Marcott in January–February 1945, this aircraft was the most intact. Although none of the Shidens were more than a few months old, some, like this example, had suffered heavy weathering in the tropical conditions of Luzon and Formosa since their arrival in the frontline. Wearing the code 341-S23 when it was captured on January 30, this fighter was subsequently stripped of its flaking camouflage and marked as TAIU-SWPA S 9. (NARA)

model which functions at low speed, and in addition changed the fulcrum arm on ailerons, rudder and elevators so as to get more control at low speeds, while still maintaining light control forces at high speeds. Production airplanes eliminated the automatic flap and the aileron fulcrum change, but keep the increased rudder and elevator with flaps down. Operation of the flaps is complicated in that the flap handle must be returned to neutral in order to have brake pressure, and also two handles are required to retract flaps. Flap handle must be in the up position and an additional flap dump valve must be pulled in order to retract flaps.

Dive brakes of panel design were found but were bolted closed.

### **EMPENNAGE**

The fin and rudder have an equal taper fore and aft and with a rounded tip. The vertical stabilizer is of SDCH aluminum, all-metal and flush riveted. The rudder is of fabric and metal, with a cockpit-controllable trim tab.

The horizontal stabilizer and elevators present an appearance of greater taper on the leading edge, lesser trailing edge taper, and rounded tips.

### **OXYGEN**

Four oxygen storage cylinders are located behind the pilot. These are mounted horizontally, two on the port and two on the starboard side.

### **PILOT'S PRELIMINARY EVALUATION OF GEORGE**

The following information is extracted verbatim from an Allied pilot's report after a test flight in GEORGE N1K2-J [aircraft was in fact an N1K1-J]:

"Taxiing and ground handling: This airplane was flown from a macadam [crushed stone] runway. Taxiing and ground handling, in general, is poor, due to poor brakes. Foot brakes are fitted on a narrow-type rudder bar and do not operate well. Rudder is not effective for taxiing. There is no tail wheel lock fitted. Taxiing with the flaps extended is improved due to the fact that the throw of the rudder is increased from 23° to 33° with flaps down.

"Take-off and Initial Climb: Take-off is normal, with little tendency to swing, if the

power is applied gradually. Airplane is tail-heavy and the tail does not come up very readily. Take-off run is short and the airplane leaves the ground easily at about 105mph. Landing gear retracts slowly with little change in trim. Initial climb is excellent. Landing flaps were not used for take-off.

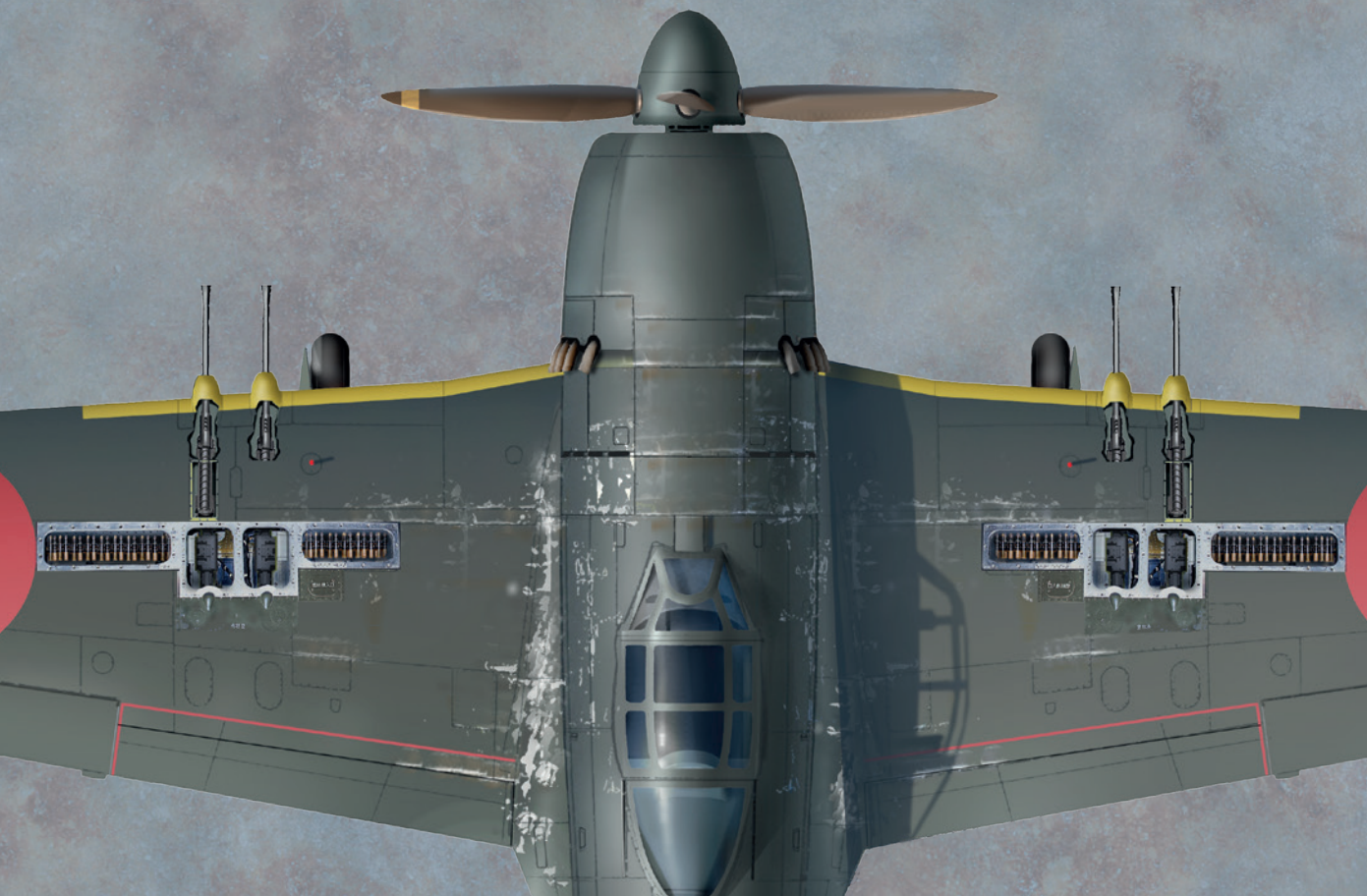
“Climb: Climb is very good. At 2,350 rpm and manifold pressure of plus 200 mm (34" Hg) indicated speed 140 mph, stabilized rate of climb indicates approximately 2,200 ft/min. at 8,000'.

“Handling and Control at Various Speeds: Airplane was tested from stall up to 360mph. The rate of roll is good. At 360mph the ailerons are very heavy and rate of roll is not good. The controls are unbalanced in that the rudder and elevator are much lighter than the ailerons and may be criticized as being too light.

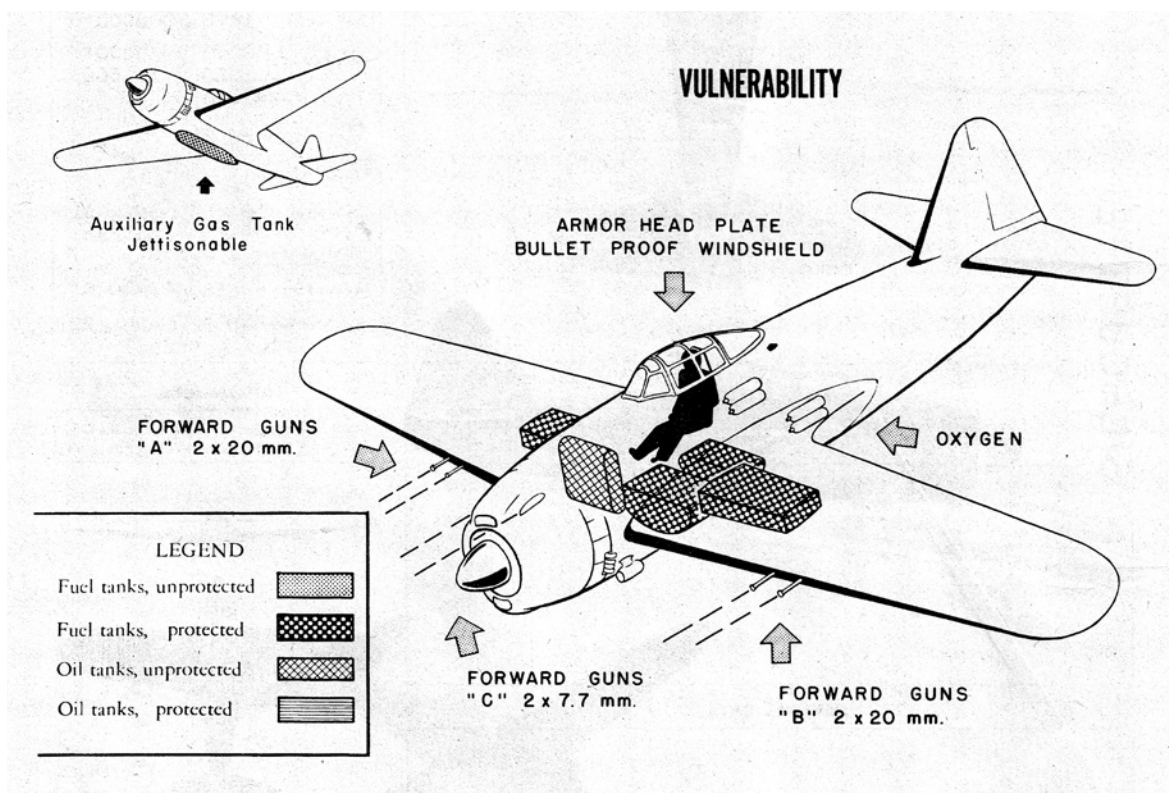
## N1K2-J WING CANNON

Like the N1K1-J before it, the N1K2-J featured four 20mm Type 99 Model 2 Mk 4 cannon. However, unlike the Shiden, which had two weapons mounted in the wings and two in underwing gondolas, all four of the Shiden-Kai's cannon were installed within the fighter's wing structure. The magazines for the inner cannon contained 200 rounds per

gun, while the outer magazines had space for 100 rounds per weapon. A Type 89 gun camera and single 7.7mm Type 97 machine gun could also be installed in the left wing for training purposes, but they were rarely seen in aircraft used by the 343rd Kokutai.







This illustrated page was taken from the detailed TAIC report on the "George 11." The purpose of these diagrams was to illustrate the aircraft's areas of vulnerability to fighter pilots and ships' gunners alike. (NARA)

"Trim and Stability: Rudder and elevators have excellent controllable trim tabs with the controls on the left-hand side of the cockpit. No aileron-controllable trim tab is fitted. There is considerable change in rudder trim with speed and power. Stability was checked at 7,000' manifold pressure minus 150mm (24.0" Hg), 2,100 rpm, oil and cowl flaps closed, airspeed 189mph indicated. Directionally and longitudinally, it is statically and dynamically stable. Laterally, it is just about neutrally stable. Stability of this airplane at cruising speed can be considered excellent.

"Stall and Stall Warning: Airplane was stalled clean and dirty:

Clean	100mph
Clean, but cowl flaps open 20°	104mph, vibrating warning
Gear down	100mph
Gear and flaps down	85mph

(Ed. Note – Above figures are apparently all with power on.)

"The airplane has a bad left wing stall under all conditions and will half-roll if not caught in time. There is no stall warning except when the cowl flaps are open. This airplane can be considered to have very poor stalling characteristics.

"Maneuverability and Acrobatics: GEORGE cannot be considered good for either maneuverability or acrobatics. It has a good rate of roll below 320mph, and light

elevators so that it turns well but the controls are unbalanced and the stick is too high and too far forward. Pilot is continually aware that there is always a heavy nose in front of him, and in addition the airplane has a bad accelerated stall. It does a snap left roll at 125mph in 2g left or right turn. Rolls and Immelmanns were executed but the airplane does not do them nicely. It had no maneuver flaps installed. No rough maneuvers were executed as this airplane had previously been crashed and rebuilt and the strength of the repair was an unknown quality. It is believed that the airplane can easily be damaged by rough handling of the light elevators.

“Change in Trim When Operating Landing Gear, Flaps, etc.: Changes in trim with the use of flaps and gear are all in the right direction. Change in trim with the use of gear is small and easily turned out. This aircraft is fitted with a device which changes the actuating arms of the elevators and rudder as the flaps are lowered. This device increases the rudder throw from 23° to 33° and the elevator from 17° up; 14° down to 35° up; 240° down. As the flaps are lowered the stick moves forward due to the fact that the elevators rotate upwards. Fowler type flaps are fitted and considerable “up trim tabs” is required to keep the aircraft trimmed during the approach and landing. Trim changes due to use of oil and cowl flaps are negligible.

“Noise and Vibrations: Engine was smooth at all rpms up to the maximum of 2,900. There is no undue noise or vibration in the aircraft.

“Approach and Landing: Approach is not considered too good due to the fact that the gear and flap handle must be returned to neutral or there is no brake pressure and there is too much change in trim as the flaps go down and as the airplane is slowed down for landing. Other than that, approach is very straight forward. Airplane is easy to land with all oleos being soft. The tail comes down readily. Vision for the approach and landing is excellent. Only one landing was made and it was made in a cross-wind. The airplane is stable in the landing run, but it should not be operated on prepared runways due to poor brakes. Prisoner of war reports that brakes should never be used in this airplane unless necessary and then only at the end of roll. This is due to weak fitting of landing gear to wing as evidenced by the continual large amount of walk of gear even on fairly smooth ground. Airplane should be operated only off smooth sod fields.

“Power Plant and Associated Equipment: Power plant, in general, is very satisfactory. It is easy to start cold, but loads up when hot. Engine is smooth at all rpms. Mixture control is similar to that found on the US AT-6 type, with a positive lock fitted. Propeller operation is hooked into the throttle and works very well. This automatic propeller-throttle arrangement should be a decided advantage in combat. Engine cooling on this airplane was not good. Cowl flaps had to be opened up fairly wide in normal climbs and cylinder head temperatures were very dependent on cowl flap openings. Oil cooling appeared to be adequate. High blower was not used.

“Hydraulic and Electric System: Airplane flaps and gear are hydraulically operated. Neither the flaps nor gear system are considered satisfactory.”

## CONCLUSION

Though GEORGE appears to function satisfactorily in the air, it is apparently difficult to maintain in operation because of its weak landing gear. An interrogation of a POW reveals that he heard it was a very difficult plane for the pilots to handle and they didn't like it. It was particularly tricky in landing and taking off, and there were accidents and crack-ups in almost every landing. There had been particular difficulty with the landing gear, and this had held up production a great deal. The gear would simply crumble under any kind of a strain at all. These difficulties may have been the result of trying to convert GEORGE from what was originally a float plane to a land-based plane.

F6F-3/5, N1K1-J and N1K2-J Comparison Specifications				
	F6F-3	F6F-5	N1K1-J	N1K2-J
<b>Powerplant</b>	2,000hp Pratt & Whitney R-2800-10 Double Wasp	2,200hp Pratt & Whitney R-2800-10W Double Wasp	1,990hp Nakajima NK9H Homare 21	1,990hp Nakajima NK9H Homare 21
<b>Dimensions</b>				
Span	42ft 10in	42ft 10in	39ft 4in	39ft 4in
Length	33ft 7in	33ft 7in	29ft 1in	30ft 7in
Height	13ft 1in	13ft 6in	13ft 3in	12ft 11in
Wing area	334sq ft	334sq ft	252.9sq ft	252.9sq ft
<b>Weights</b>				
Empty	8,951lb	9,153lb	6,387lb	5,858lb
Loaded	12,213lb	15,413lb	9,526lb	10,714lb
<b>Performance</b>				
Maximum speed	375mph at 23,700ft	380mph at 23,700ft	363mph at 19,355ft	369mph at 18,375ft
Range	1,620 miles with drop tank	1,530 miles with drop tank	1,581 miles with drop tank	1,488 miles with drop tank
Service ceiling	37,500ft	37,300ft	41,010ft	35,300ft
<b>Armament</b>	6 × 0.50in. Browning M-2 machine guns	6 × 0.50in. Browning M-2 machine guns or 4 × 0.50in. Browning M-2 machine guns and 2 × 20mm AN/M2 cannon	2 × 7.7mm Type 97 machine guns and 4 × 20mm Type 99 Model 2 cannon	4 × 20mm Type 99 Model 2 cannon



# THE STRATEGIC SITUATION

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By the time the N1K1-J fired its guns in anger for the first time, on October 12, 1944, the IJNAF was struggling to make good the heavy losses it had suffered in a series of one-sided clashes with US forces during the previous ten months. The US Navy's island-hopping advance through the central Pacific had been in full swing for more than a year, with the IJN's First Mobile Fleet being all but destroyed by TF 58 in the Mariana Islands chain during the First Battle of the Philippine Sea on June 19/20, 1944.

Aside from the three Japanese fleet carriers sunk during this action, the IJNAF lost 443 carrier aircraft and more than 200 land-based airplanes – Hellcat squadrons alone claimed 217 Zero-sens downed on June 19 during the famous “Great Marianas Turkey Shoot.” With 90 percent of the aircraft assigned to the IJN's carrier air groups destroyed in just two days, the defeat in the Marianas signaled the end of the IJNAF as an effective fighting force.

With the threat of the First Mobile Fleet removed, TF 58 was free to continue its offensive in the central Pacific without fear of serious opposition. The first F6F-5s to reach the fleet saw action over the Bonin Islands on July 4, when VF-2 (embarked in *Hornet*) and VF-13 (embarked in *Franklin*) participated in strikes on Iwo Jima and Chichi Jima, followed by attacks on Guam later that same month. Although the latter unit had deployed fully equipped with -5s, combat-seasoned VF-2 progressively replaced its “flyable duds” among its battle-weary -3s with brand new Hellcats shipped from California to the US Navy's large forward base at Majuro Atoll, in the Marshall Islands.



Pilots from VF-2 man their F6F-3s aboard *Hornet* on the morning of June 19, 1944 – a day subsequently known as the “Great Marianas Turkey Shoot.” “Fighting Two” claimed 51 aerial victories on the 19th, placing it second behind VF-15 “Satan’s Playmates” aboard *Essex*, which set the all-time US record of 68 victories in one day. Overall, the 15 TF 58 fighter squadrons that engaged the IJNAF on June 19 put in claims for 330 aircraft shot down. Defeat in the Marianas during the First Battle of the Philippine Sea on June 19/20, 1944 signaled the end of the IJNAF as an effective fighting force. (NARA)

equipped with one or the other of the two Hellcat models.

Following the disastrous Marianas battle, the IJNAF had set about reorganizing what remained of its aviation units, disbanding those decimated in recent combats and absorbing surviving pilots into others. Although units were soon brought back up to strength in terms of aircraft numbers through new production, there was a critical shortage of experienced pilots and combat leaders. This meant that in some units, the majority of pilots were classed as barely operational, able to fly their aircraft but lacking adequate training in combat tactics and gunnery.

As during the First Battle of the Philippine Sea, the A6M5 Zero-sen remained the mainstay of the IJNAF’s fighter Kokutai into the fall of 1944, despite more than 200 having been shot down by Hellcats over the Marianas. This was primarily because large-scale production of the land-based replacements for the aircraft, the J2M Raiden and N1K1 Shiden, had been continually delayed due to technical problems. By the end of August 1944, Kawanishi had delivered only 521 Shidens and just seven improved Shiden-Kais to the IJNAF in the previous nine months. Grumman, by contrast, was building more than 500 Hellcats per month.

Knowing that the forthcoming defense of the Philippines would be vital to Japan’s survival, the IJNAF assigned the majority of its fighter squadrons to this theater. While the Kokutai being sent to airfields in the region were, in the main, flying A6M5s, the air groups of the US Navy’s Fast Carrier Task Force (which subsequently became TF 38 when it was assigned to Third Fleet) were rapidly re-equipping with the F6F-5. In August 1944 the US Navy changed the composition of its carrier air groups, increasing the complement of their fighter squadrons to 54 aircraft by reducing the number of dive-bombers from 36 to 24. TF 38 now had nine *Essex*-class and eight *Independence*-class carriers, with 560 Hellcats (including photo-reconnaissance -5Ps and -3N/5N nightfighters) embarked. A highly efficient logistical system assigned a number of dedicated transport carriers brought a steady stream of replacement aircraft to the fleet from the US.

Resplendent in overall Glossy Sea Blue, these machines looked very different to the sun-faded F6F-3s in their “tri-color” camouflage of Sea Blue, Intermediate Blue, and White that they were replacing. Initially, the new Hellcats were distributed to VF-2’s division and section leaders, to operate alongside the older aircraft. However, during a three-day shakedown cruise on board *Hornet* in August it was soon determined that the new fighters had a performance edge that made it difficult for the older F6F-3s to keep up in combat maneuvers. Thus, divisions were

In mid-September, TF 38 launched a series of strikes against Japanese air bases in the Philippines. Over four days, the Hellcat squadrons claimed 94 Zero-sens shot down. The relative lack of Japanese resistance brought a change of plans, bringing forward the invasion of the Philippines to October 20, 1944 with landings on Leyte. This date had finally been



agreed upon during a conference in Pearl Harbor between President Franklin D. Roosevelt, Adm Chester Nimitz and Gen Douglas MacArthur.

The US Navy had favored bypassing the Philippines altogether and taking Formosa instead, which could in turn provide airfields from which USAAF B-29 bombers could strike at targets in both enemy-held China and Japan itself. However, there were not enough troops in the Pacific to mount such an invasion. Roosevelt was also concerned that MacArthur would resign his position as Supreme Commander of Allied Forces in the Southwest Pacific if he was not allowed to make good his 1942 promise that "I shall return" to the Philippines, and instead seek the Republican nomination for President in the elections that autumn. Thus, the major American offensive was aimed at the Philippines, the liberation of which did not really affect the ultimate outcome of the war.

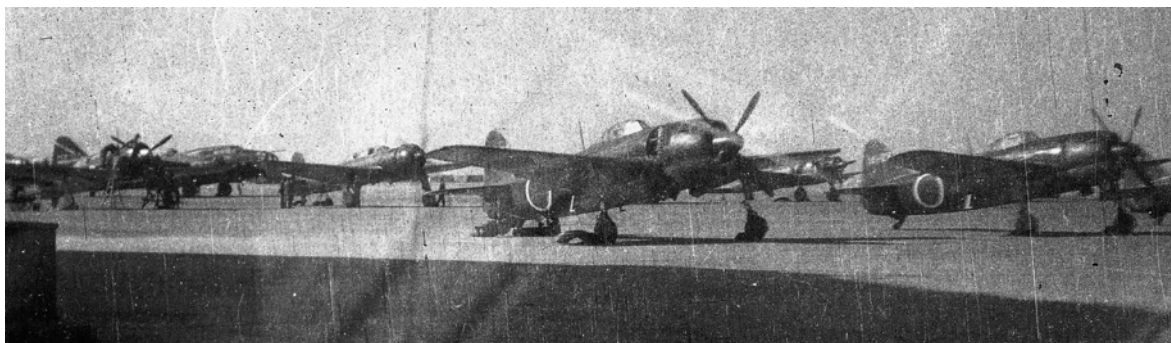
The Fast Carrier Task Force was charged with reducing Japanese air strength on Formosa and Luzon in preparation for the amphibious assault in the Philippines. During three days of strikes on Formosa, on October 12, 13 and 14, the Hellcat squadrons claimed 107 Zero-sens shot down from a total of 353 Japanese aircraft destroyed. A number of Shidens were unwittingly included in this tally, the Hellcat pilots being unaware of the presence of the new fighter in the frontline.

Over the next two months, TF 38 provided support for the landings on Leyte, Mindoro and Luzon. In aerial battles with IJNAF and Imperial Japanese Army Air Force (IJAAF) fighters during the campaign for the Philippines, the Hellcat-equipped units flying from the fast carriers claimed in excess of 900 aircraft shot down and hundreds more destroyed on the ground.

By then all the Shidens that had been hastily flown to Luzon following the invasion of Leyte Island on October 20 had either been shot down, destroyed on the ground in strafing attacks, damaged in landing accidents or simply abandoned due to unserviceability. Surviving 341st Kokutai aircrew were flown back to Formosa on IJNAF and IJAAF transport aircraft in early January 1945 and instructed to prepare for the defense of the Home Islands. The groundcrew were left in Luzon with their Shidens, fighting on to the death as infantrymen.

Groundcrew and fellow pilots wave as a Special Attack pilot taxis his A6M5 out for take-off from a base in the Philippines in October–November 1944. Shiden-Kai pilots were tasked with escorting formations of kamikaze aircraft launching attacks from airfields in the Home Islands from April 1945. (NARA)





Sento 401st Hikotai N1K1-Js sit on a packed ramp at Miyazaki, in southern Kyushu, during a stop en route to the Philippines in late October 1944. The Shidens flew more than 300 sorties during the campaign, none making it back to Japan from the Philippines. G4M Rikkos, A6M Zero-sens and a lone B6N Tenzan can be seen parked behind the Shidens. [Author's collection]

#### OPPOSITE

The Shiden had first seen combat in October 1944 flying from airfields on Formosa, and from February 1945 surviving examples were embroiled in the defense of the Home Islands. Shiden-Kais, flying from airfields on Shikoku and then Kyushu, went into action in response to the Allied build-up to Operation *Iceberg* – the invasion of Okinawa. The battleground for this bitterly fought campaign stretched from Kyushu to Formosa. The Shimbu-Tai units that relied on JAAF and IJNAF fighters (including N1K2-Js) for protection flew from airfields on Kyushu and on Formosa. Their targets were the American transport vessels anchored off the west coast of Okinawa and the carriers of TF 58 steaming to the east of the island. The Special Attack units and their escorts followed the Ryukyu Islands chain to their targets.

## DEFENSE OF THE HOME ISLANDS

By early 1945, Japan's strategic military and economic situation was dire. Following the successful invasion of Luzon on January 9, US forces had liberated the Philippines and were now well positioned to permanently sever Japan's already tenuous sea links to the vital raw materials it had previously been shipping back from its territories in Southeast Asia. US Navy submarines had been waging an increasingly effective war on Japanese merchant vessels since late 1942, and by early 1945 the country was totally dependent on the remaining reserves of fuel and metals stockpiled in the Home Islands. Imports of oil from fields in the East Indies had stopped completely in December 1944, and by the spring of 1945 aircraft production had decreased by one-third and aero engine production by two-thirds.

In the frontline, the ill-fated defense of the Philippines had inflicted a terrible toll on the IJAAF and IJNAF, with thousands of airplanes (including 40 Shidens) and pilots, the bulk of the IJN's remaining capital ships and tens of thousands of troops lost. In the wake of this defeat, the Japanese Imperial General Headquarters quickly realized that the next stage of the US advance would see the nation's inner defensive ring directly attacked. The most obvious target was Okinawa, in the Ryukyu Islands, which, if seized, could be used as a base for the invasion of Japan. Fully aware that it could not hope to hold Okinawa in the face of such overwhelming odds, the Imperial General Headquarters decided instead to prepare Japan for the inevitable air attacks from long-range USAAF B-29s flying from the Marianas, followed by an amphibious invasion. Senior officers believed that the only way of securing Japan's survival was to inflict such horrific losses on Allied forces that they would be forced to abandon their invasion of the Home Islands. Formosa, the Bonin Islands and Okinawa had to be stoutly defended to the very last man.

For the defense of Okinawa, designated Operation *Ten-go*, Imperial General Headquarters reorganized Japan's air defenses. Responsibility for countering US air raids on the main island of Honshu fell to the IJAAF's Tokyo-based 1st Kokugun (1st Air Army) with the 10th, 11th and 12th Hiko Shidan (Air Divisions), and the IJNAF's Home Defense Force, with some 500 aircraft in total. To protect the approaches to the Home Islands, the 6th Kokugun and 3rd, 5th and 10th Koku Kantai (Air Fleet) in Japan and the 8th Kokugun and 1st Koku Kantai in Formosa had approximately 4,600 aircraft. Included in the latter figure were a growing number of N1K2-Js of the 343rd Kokutai, which was assigned to the 3rd Koku Kantai on February 10, 1945.

Because of insufficient advanced fighters, including the Shiden-Kai, a paucity of experienced pilots following losses in the Philippines and the impossibility of completing the instruction of a new intake of trainee aviators before the likely date of a US attack, the IJAAF and IJNAF decided to rely on mass kamikaze attacks to destroy the invasion fleet. Both services converted entire training classes into Tokubetsu Kogeki Tai (Special Attack Units).

US military planners believed the only way to force Japan to accept unconditional surrender was through the invasion of the Home Islands. With the seizure of the Philippines to provide a fleet base, there was no longer the need to invade Formosa. To save time and resources, the US Joint Chiefs of Staff decided instead to occupy Iwo Jima and turn it into an advanced base for fighters to escort the B-29s over Japan, and then to take Okinawa as a base for the planned invasion of Kyushu, scheduled for November 1945. Fighters and medium bombers could reach Kyushu from Okinawa to soften up Japanese defenses prior to the invasion.

Designated Operation *Iceberg*, the invasion of Okinawa would involve a massive force of 541,000 men from four US Army and three US Marine Corps divisions. They would be supported by the US Navy's Fifth Fleet, with an invasion covering force and TF 58 – the Fast Carrier Task Force – providing air cover until land-based US Marine Corps and USAAF units could take over using captured Okinawan airfields. For the



initial invasion, TF 58 had 11 *Essex*-class fleet carriers and six *Independence*-class light carriers, the majority of which embarked F6F-5s.

To counter the kamikaze threat, the US Navy increased the number of fighters on board the *Essex*-class vessels from 54 to 73, cutting back bomber and torpedo airplanes to 15 apiece per carrier. These created enlarged fighter squadrons that soon proved too difficult to administer, so on January 2, 1945 the US Navy split such units in two, creating a fighter squadron (VF) and a fighter-bomber squadron (VBF). This gave the carrier groups more aircraft for combat air patrols (CAPs) to protect the fleet, while the fighter-bombers made up for the reduced number of embarked bombers.

The battle for Okinawa lasted 11 weeks. Operation *Ten-Go* failed, the IJAAF and IJNAF launching ten Kikusui (Floating Chrysanthemum) attacks that saw 1,465 Special Attack aircraft and their crews lost. In total, the IJAAF and IJNAF had approximately 3,000 airplanes destroyed attempting to defeat the US invasion of Okinawa. The IJNAF used its more experienced pilots and better aircraft (specifically the N1K2-Js of the 343rd Kokutai) on sweeps attempting to clear a path for Special Attack Units making their way to Okinawa, where the Tokubetsu Kogeki Tai sought out US Navy vessels. The carrier air groups of TF 58 flew repeated strikes against the Special Attack bases on Kyushu and CAPs in defense of the fleet throughout the long-running campaign.

With the loss of Okinawa, Japan now faced invasion. The American strategy was to undertake an air and sea blockade, cutting the nation off from all imports of fuel, raw materials and food to weaken its capacity to make war, prior to launching the largest amphibious assault of the Pacific campaign. While USAAF B-29s would continue their attacks on industrial cities, aircraft factories and oil refineries, the US Navy's Fast Carrier Task Force (supported by the British Pacific Fleet) struck airfields, shipping and industrial plants, as well as wearing down IJAAF and IJNAF air strength through attrition, in a series of missions along the southern coast of Japan. Operation *Olympic* – the invasion of Kyushu – was planned for November 1, 1945.

In the face of such overwhelming force, Imperial General Headquarters had few options for Operation *Ketsu-Go* – the defense of Japan. A joint IJAAF–IJNAF agreement signed on July 13, 1945 outlined the principal objectives of the air plan. The most important mission was to destroy the US invasion force while it was still on the water in the first stages of landing. To help achieve this, the IJNAF's 3rd, 5th and 10th Koku Kantai stated they could muster almost 4,000 Special Attack aircraft by the end of August. The secondary missions for the IJNAF (and IJAAF) was to provide for the air defense of Japan and disrupt US pre-invasion operations with its regular air units. For this role, the IJNAF's air fleets had approximately 1,200 aircraft available.

As the air attacks on Okinawa petered out in June, the Imperial General Headquarters ordered the IJAAF and IJNAF to refrain from combat with intruding US fighter and bomber formations as much as possible, so as to rebuild their aircraft strength following the devastating losses over Okinawa. USAAF air raids on Japanese aircraft factories were having such a serious impact on production, however, that this directive was soon reversed, with units (including the 343rd Kokutai) told to respond aggressively to US attacks with the forces that were available. All aerial opposition ended on August 15, 1945 following the broadcasting of Emperor Hirohito's surrender speech to the nation.



# THE COMBATANTS

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## US NAVY PILOT TRAINING

For the F6F pilot who engaged his counterpart flying a Shiden over the Philippines or Formosa in the final months of 1944, or a Shiden-Kai off the Ryukyus or over the Home Islands in 1945, his experience of training leading up to this point had been qualitatively different than what his Japanese foe had received. By this late stage of the Pacific War the US Navy's training system was operating at the height of its efficiency, providing a wide-ranging program covering flying skills, combat tactics and gunnery.

In contrast to the IJNAF, the US Navy's training program benefited from an adequate number of experienced instructors, unlimited fuel for flying and a steady supply of training airplanes and frontline operational aircraft. With production at high levels, there were now enough fleet fighters available to provide adequate numbers of Hellcats to both combat squadrons and operational training units. The number of aircraft in the US Navy's training command peaked in 1944 at 9,652.

At the end of 1943, Naval Air Training Command was established to control all phases of training at the three subordinate commands – Primary, Intermediate and Operational Training Commands. During 1944, this system trained 21,067 Naval Aviators for the US Navy and US Marine Corps.

An aviation cadet began his training with three months at Flight Preparatory School, where he took classes in the basic elements of flight, navigation, math, physics and aircraft and ship recognition. He also undertook intensive physical training. From there the aviation cadet went to a War Training Service school for three months of elementary flying training with civilian flight instructors on light airplanes including the Piper J-3 Cub, accumulating around 40 hours of dual and solo flight time. If



successful, the aviation cadet then moved to a primary training school for up to 14 weeks of flight instruction in the Naval Aircraft Factory N3N or Boeing N2S Stearman primary training biplanes. The emphasis in primary training was on learning to fly the aircraft with precision, individually and as part of a formation. During primary training the aviation cadet would accumulate another 90 to 100 hours of flying time.

In the intermediate training phase, the aviation cadet learned to fly heavier and more powerful airplanes in anticipation of moving on to operational aircraft. At Pensacola, Florida, or Corpus Christi, Texas, cadets spent 14 to 18 weeks gaining another 160 hours of

US Navy and US Marine Corps pilots completed their primary training on Naval Aircraft Factory N3N or Boeing N2S Stearman biplanes. Both types are seen here at NAS Corpus Christi, Texas, during a typical day's flying in 1943, the base providing intermediate flight training for more than 35,000 Naval Aviators from December 1941 through to August 1945. Covering 20,000 acres, Corpus Christi was the largest naval aviation training facility in the world. Airfields in the southern USA and along the Gulf Coast provided good weather for training almost year round. (US Navy)

flying time. During the first part of intermediate training the cadet would fly the Vultee SNV Valiant, moving on to the North American SNJ Texan in the advanced stage. Here, a cadet selected for training as a fighter pilot would begin working on more advanced formation flying, elementary combat tactics and aerial gunnery. On completion of intermediate training the cadet would receive his wings and a commission as an ensign in the US Navy. By this time a cadet would have acquired around 300 hours flying time before moving to an operational training unit to become a fully qualified service pilot.

US Navy pilots destined for fighter squadrons went to one of several operational training units at fields on the southeast coast of the USA. Here, they were introduced to service airplanes, learning to fly the F4F/FM-2 Wildcat, the F6F Hellcat and the F4U Corsair. Operational training involved an intensive course in fighter tactics and gunnery, combining ground school and flying practice that added a further 100 flying hours to a trainee fighter pilot's logbook.

Lt(jg) James R. Ean was among thousands of Naval Aviators who learned to fly the Hellcat during 1944. Unlike most of his contemporaries, however, he had already completed his naval flight training as a dive-bomber pilot and been assigned to a Douglas SBD Dauntless unit when he received orders to retrain on fighter-bombers:

I was an obvious choice for retraining, as I had logged time in the FM-2, the General Motors license-built variant of the F4F Wildcat. The FM-2 was a good, true aircraft and, after having flown it, I looked forward to flying the F6F. The Hellcat was a big, solid-looking aircraft. It dwarfed any other naval fighter I had encountered. The cockpit was comfortable and roomy. The instruments, gunsight and aircraft controls were all readily available and laid out in a very orderly manner so there was little chance for confusion during the stressful moments of aerial combat. One aspect of the Hellcat that I particularly liked was its stability, even during formation flying. It remained stable during cross-overs and cross-unders and was not difficult to control when you encountered slipstream; you could bring it right back into position.



A student pilot carefully lines up his SNJ-3C Texan on the flight deck of the training carrier USS *Wolverine* [IX-64], sailing in Lake Michigan, prior to take-off. The culmination of the advanced stage of the intermediate training phase would see US Navy pilots practice carrier landings and complete eight recoveries either on an escort carrier or one of the two converted passenger liners used for carrier landing practice in Lake Michigan. [US Navy]

The goals of operational training were to ensure the neophyte fighter pilot learned to fly a high-performance airplane with confidence, and practiced basic fighter maneuvers until they became second nature. The trainee learned to fly as part of a division of four airplanes – the US Navy’s basic fighting formation – being taught how to operate as a wingman in support of his element leader. There was intensive practice in aerial gunnery and gunnery approaches, learning the mechanics of deflection shooting until this too became automatic. US Navy pilots would practice carrier landings and complete eight recoveries either on an escort carrier or one of the two converted passenger liners used for carrier landing practice in Lake Michigan, off Chicago. Ean was thankful that the Hellcat enjoyed benign handling characteristics during what was always the most difficult phase of a would-be Naval Aviator’s flying training:

Another feature of the Hellcat which endeared it to the average pilot was that during Field Carrier Landing Practice [FCLP] you could literally “hang” the aircraft on its propeller – with gear and flaps extended into the slipstream – and still feel as though you were exercising sufficient control over the aircraft. FCLPs were the final step before

*Wolverine* was originally built as Great Lakes side-wheel steamcruiser *Seeadbee*, operating as such from June 1913 until March 1942, when the US Navy purchased it. Converted into a freshwater carrier for the advanced training of Naval Aviators on Lake Michigan, the vessel “trapped” its first aircraft in September 1942. From 1943 until war’s end, *Wolverine* and its sister-ship, USS *Sable* [IX-81], trained 17,000 pilots, landing signal officers and other naval personnel. The ship was decommissioned in November 1945 and sold for scrap. [Author’s collection]







Although the Hellcat was far easier to land on a carrier than its contemporary, the Corsair, inexperienced Naval Aviators could still easily get into trouble during the early stages of “blue water” operations in the Grumman fighter. This F6F-3 came to grief during a deck qualification period in 1944. Lashed to *Wolverine*’s side after its undercarriage snagged the starboard catwalk as the aircraft rolled right on landing, it was later retrieved and returned to service. (Author’s collection)

qualifying for take-offs and landings aboard a carrier, and we made those flights “on” and “off” a portion of the runway at the US Naval Air Station at Glenview, Illinois, that was marked off to resemble an actual flight deck. We flew FCLPs in both the SBD and F6F before heading out to Lake Michigan, where our “carrier” awaited us.

About an hour before I was to begin my carrier qualification, I bounced a few FCLPs with my F6F. When the Landing Signal Officer [LSO] was satisfied, he gave me a piece of paper on which was written the direction and distance to USS *Wolverine* (IX-64). Then off I went, in fog, to find the training carrier. All of my training paid off, however, and when I did find the ship, I made a very easy, slightly nose-up landing that was quite smooth.

The Hellcat always responded in great style, and as one became more accustomed to its response, one’s feeling of confidence in the aircraft increased. That was coupled with excellent visibility for approaching the carrier. There was no trouble in spotting and keeping the LSO in view during all phases of the approach to the carrier.

By the time he completed his operational training, a US Navy pilot would have accumulated 400 to 500 hours flying time – nearly double what his Japanese counterpart would have accrued during the same period.

Young Naval Aviators added to their flying hours while undertaking intensive combat training once they joined a fleet squadron. By this stage of the war the US Navy had enough combat units in its carrier air groups to be able to rotate them out of the frontline for periods of rest and rebuilding. Pilots fresh from operational training would join their squadrons, where they would undergo more training in combat flying under the experienced eyes of veterans who had served one or more combat tours and were preparing their squadrons for the next deployment.

New pilots were assigned to a division, where they flew as wingmen to more experienced pilots who would train them in aerial combat, bombing, strafing and the other skills they would need when engaging the enemy. In contrast to a newly trained IJNAF pilot, a US Navy fighter pilot going off to combat in the fall of 1944 would have had not just more flying hours, but better and more comprehensive practice in controlling his airplane, in air combat tactics and in aerial gunnery.

## 343rd KOKUTAI

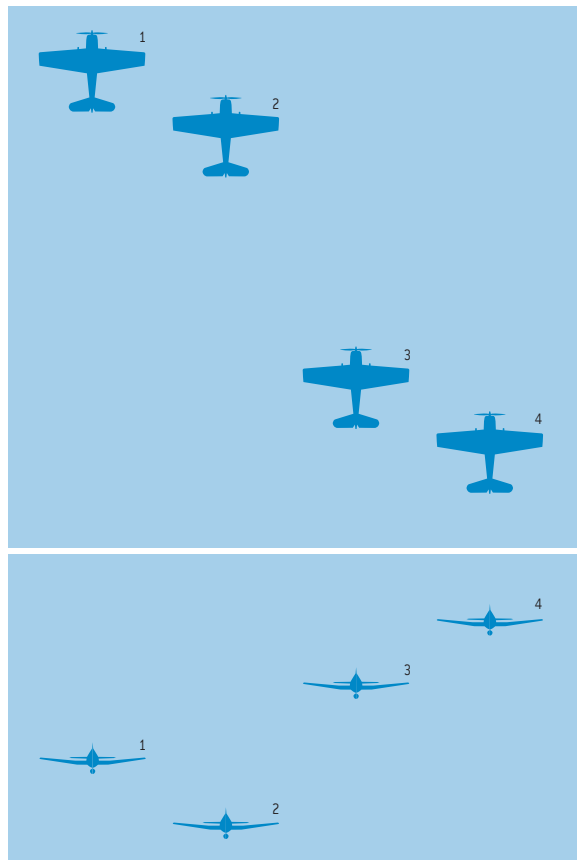
Rather than repeat details of the IJNAF pilot training syllabus contained in previous volumes in this series (specifically *Duels 54* and *62*), the author has decided to focus on the establishment of the primary unit to see combat with the N1K1/2, namely the 343rd Kokutai. Although many of the IJNAF fighter pilots encountered by Naval Aviators in

their F6Fs from October 1944 were indeed combat neophytes, a significant percentage of those men flying Shidens and, in particular, Shiden-Kais, had in fact accrued hundreds of hours of frontline flying in A6M Zero-sens. This was especially the case with the 343rd Kokutai, which had been formed specifically to operate the N1K2-J. This was in fact the unit's second iteration, for it had originally been formed on January 1, 1944 and slated to receive Shidens. However, just one N1K1-J had been delivered to the Kokutai, at Kagoshima by the end of February when it was decided that the unit would be issued with A6Ms instead. The 343rd was effectively wiped out in the ill-fated defense of Palau and Guam in June–July 1944.

The second 343rd Kokutai was formed as a direct result of a new strategy proposed by Capt Minoru Genda, the mastermind behind the December 7, 1941 attack on Pearl Harbor. A brilliant strategist, combat veteran (with both land- and carrier-based units) and former naval air attaché, Genda was serving with the IJN General Staff in 1944 when he became increasingly alarmed at the ineffectiveness of naval fighter units in their attempts to defend IJN vessels battling the US Navy as it clawed back territory once held by Japan in the southwest and central Pacific.

“In late 1944, I thought thoroughly about the unfavorable war situation,” Genda wrote in his post-war memoir. “Our battles were being lost because of defeats at sea. Defeat in battle was caused by the fact that we were overwhelmed in the air war. We were losing the air war because we had failed to secure air superiority with our fighters. In short, we were losing the war because our fighters were being defeated.” Following the IJN's heavy defeat at the Battle of Leyte Gulf in late October 1944, when it lost 26 warships (including four aircraft carriers and three battleships) and more than 300 aircraft, Genda proposed a new strategy to naval GHQ. Explaining that Japan was losing the war because the enemy had control of the skies, he tabled a radical idea that saw the creation of an elite unit commanded by Genda, led by veteran squadron leaders and equipped with the IJNAF's newest fighter, the Shiden-Kai. His aim was to regain air superiority and try to turn the tide of war. Genda was given approval for his new unit.

Established on December 25, 1944, the 343rd Kokutai was attached to the 3rd Koku Kantai on February 10, 1945. Genda had become its CO on January 15, the 343rd calling Matsuyama airfield, on the island of Shikoku, home. The latter had been chosen by the CO of Sento 301st Hikotai, ace Lt Naoshi Kanno, after Yokosuka, near the mouth of Tokyo Bay, had proven to be too small for the unit's needs. The 301st became the first unit assigned to the 343rd Kokutai, followed by Sento 407th Hikotai, Sento 701st Hikotai and Sento 401st Hikotai (which would function as a training unit). Sento 402nd Hikotai also briefly came under control



US Navy fighter units typically operated in divisions of four aircraft, which comprised a pair of two-airplane sections. This basic formation was used for CAPs, under the direction of a Fighter Director Officer. When engaging kamikazes, fighters would stay closed-up in one of four formations as they approached the intercept point to avoid confusing the radar picture for US Navy picket ships. The formations were designed to place the main intercepting force some 2,000–3,000ft above the estimated height of the enemy formation to give superiority of position, with a part of the formation flying above to provide high cover.



Capt Minoru Genda (left) and Lt Cdr Yoshio Shiga enjoy the spring sunshine at Matsuyama in 1945. As commander officer and executive officer, respectively, of the 343rd Kokutai, neither man flew operationally. Nevertheless, they were qualified to fly the Shiden-Kai (Shiga had been heavily involved in its test program at the Air Arsenal) and they routinely wore leather flying helmets to show solidarity with their men. (Author's collection)

of the 343rd, prior to it being posted to the 601st Kokutai in March.

Upon his arrival at Matsuyama on January 29, Genda set about assembling his staff. With 3,000 flying hours in fighters, he knew exactly the caliber of men he needed – veteran air officers that had fought in combat and distinguished themselves as leaders. Genda's first appointment filled these criteria, and more. A veteran of the campaign in China

(where he had claimed four victories), the Pearl Harbor raid and numerous other carrier-based operations from *Kaga*, *Junyo* and *Hiyo*, recently promoted Lt Cdr Yoshio Shiga had also spent time as a test pilot with the Air Arsenal. He had been one of the first Naval Aviators to fly the Shiden-Kai. Indeed, when the 343rd was formed, there was no other pilot in the IJNAF as familiar with the N1K2-J as Shiga, who became the unit's executive officer.

Fellow China War veteran Cdr Tadashi Nakashima, who had claimed three or four victories in 1937 and later led the Tainan Kokutai in Rabaul and a kamikaze unit in the Philippines, was made vice-commander. Finally, Genda handpicked his squadron COs after reviewing a list of potential candidates from throughout the IJNAF. The three men he chose were all aces, and they would all subsequently perish in combat

flying with the 343rd. Lt Takashi Oshibuchi, squadron leader of Sento 701st Hikotai, was also a veteran of the 251st Kokutai (formerly the Tainan Kokutai). Later made CO of the 203rd Kokutai's Sento 304th Hikotai, Oshibuchi had at least six victories to his name when he was posted to the 343rd after recovering from wounds he had suffered over Luzon.

"Oshibuchi's formation leading was splendid," Genda recalled. "I had almost nothing to criticize about him. His relationship with his men was wonderful. They seemed to be proud to die with their leader."



Six-victory ace Lt Takashi Oshibuchi joined Sento 701st Kokutai as its squadron leader following the unit's assignment to the 343rd Kokutai. He had claimed two victories with the Shiden-Kai by the time of his death in combat with VF-49 F6F-5s on July 24, 1945. (Author's collection)



Unlike Oshibuchi, who joined his unit after its assignment to the 343rd, the CO of Sento 407th Hikotai had led the squadron since its formation in July 1944, when it was part of the 221st Kokutai. Flying A6Ms, Lt Yoshishige Hayashi had seen combat with the 407th in the Philippines. By the time the unit was posted back to Japan, minus its aircraft, in early January 1945, Hayashi had claimed five victories.



Sento 301st Hikotai's CO was 20-plus victory ace Lt Naoshi Kanno, who joined the unit with a fierce reputation as a dogfighter with a violent temperament. A veteran of the Marianas and Philippine campaigns with the 201st Kokutai's Sento 306th Hikotai, Kanno had been appointed leader of the kokutai's first kamikaze flight. However, he was in Japan collecting replacement aircraft when the mission was flown from Mabalacat. Distraught at the news, Kanno vowed to fight on with the 301st. His effectiveness as a fighter pilot is proven by the simple fact that none of his contemporaries who commenced their combat careers in 1944 attained as a high a score as Kanno.

Aside from an experienced officer cadre, the 343rd also had a core of enlisted pilots that had seen combat in Rabaul and the Philippines. "We assembled outstanding fighter squadrons from the start," Genda explained. "There were veterans, of course, but there were also many unskilled pilots too." Indeed, the latter made up 55 percent of the Naval Aviators assigned to the kokutai. Some of the combat-seasoned enlisted men who joined the 343rd did so with their respective squadron leaders, while others were handpicked by the kokutai in accordance with Genda's needs. Survivors from the three Shiden-equipped units previously under the control of the 341st Kokutai, which had seen heavy action in the Philippines, were also posted to Matsuyama.

The most famous NCO pilot to transfer in was CPO Shoichi Sugita, whose combat career had started with the 204th Kokutai in the South Pacific. Involved in the ill-fated Adm Isoroku Yamamoto escort mission, he bailed out with severe burns in August 1943 after being shot down by Corsairs near Ballale. Sugita returned to the fighting with the 201st Kokutai over the Marianas, retreating to the Philippines with the unit. By the time he joined Sento 301st Hikotai, Sugita had claimed almost 120 victories (historians have since stated his tally was closer to 70, 30 of which were shared kills).

Sugita brought his wingman, CPO Tomokazu Kasai, with him from the 201st Kokutai. An ace in his own right with ten victories to his name, Kasai occasionally served as wingman to Lt Kanno too. The ranking NCO ace in Sento 407th Hikotai was WO Minoru Honda – he was also the unit's senior NCO, fighting with it over the Philippines. Having served with the unit since its formation, Honda had survived considerable combat

#### ABOVE LEFT

Lt Yoshishige Hayashi was already serving as CO of Sento 407th Hikotai when it was assigned to the 343rd Kokutai in early January 1945, having led the unit since its formation six months earlier. He "made ace" with a solitary Hellcat victory in the Shiden-Kai prior to being killed attempting to ditch his battle-damaged fighter on April 21, 1945. [Author's collection]

#### ABOVE RIGHT

Sento 301st Hikotai's CO was 20-plus victory ace Lt Naoshi Kanno, who joined the unit with a fierce reputation as a dogfighter with a violent temperament. Always in the thick of the action, he claimed a further four victories [F6Fs and F4Us] with the Shiden-Kai, before he was lost on August 1, 1945 fighting with P-51Ds escorting B-24s. [Author's collection]



N1K2-Js sit in the snow at Matsuyama airfield shortly after their delivery to the 343rd Kokutai in early February 1945. Each of the squadrons in the kokutai was supposed to be equipped with 48 Shiden-Kais, yet despite Kawanishi working round-the-clock, only 35 aircraft had been delivered in January, followed by 47 in February and 56 in March. Finished fighters were flown directly from the Naruo plant to Matsuyama by 343rd pilots. [Author's collection]

with the Kanoya Kokutai in the Solomons in 1942–43. Indeed, he had even been declared dead after he failed to return from a mission. Honda eventually made it back to base some ten days later with the help of friendly natives. Although a strict disciplinarian, Honda proved to be an effective tutor for the new pilots assigned to the 343rd.

With four F6F victories to his name flying the Shiden off Taiwan, 31-year-old Ens Akio Matsuba had been among the last pilots to escape the Philippines with the Sento 701st Hikotai. A veteran of the China War, combat from the carrier *Ryujo* and the defense of Iwo Jima with Sento 301st Hikotai, Matsuba had a tally of 18 victories when Sento 701st Hikotai was transferred to the 343rd Kokutai. Upon his arrival at Matsuyama, Matsuba was ordered by Genda to give a special two-hour lecture on his experiences with the Shiden in combat.

Fellow aces WO Isamu Miyazaki and CPO Mitsuo Hori were also posted in, as were battle-hardened pilots WO Narunobu Ibusuki and CPO Toshio Tanaka. Finally, legendary ace Ens Saburo Sakai served as an instructor with Sento 701st Hikotai until June 1945. The 64-victory ace was prevented from flying combat missions with the unit after losing an eye during the aerial battle for Guadalcanal in August 1942. Following a long recuperation, Sakai had fought with the Yokosuka Kokutai over Iwo Jima in 1944. However, his failing eyesight badly affected his performance in combat and he was restricted to the role of fighter instructor – a task he performed with distinction in the 343rd.

The trainee fighter pilots received intensive instruction from the veteran Naval Aviators at Matsuyama, who placed special emphasis on quick take-offs and formation flying. Each squadron also conducted eight-versus-eight mock dogfights as more Shiden-Kais arrived at Matsuyama. Despite receiving a steady flow of new aircraft, the 343rd was still in the process of converting to the N1K2-J in mid-March. Each of the squadrons in the kokutai was supposed to be equipped with 48 Shiden-Kais, yet despite Kawanishi working round-the-clock, only 35 aircraft had been delivered in January, followed by 47 in February and 56 in March. Finished fighters were flown directly from the Naruo plant to Matsuyama by pilots from the 343rd.

As with the Shiden, technical problems plagued the Shiden-Kai, most relating to its Homare 21 engine. The latter was forced to run on poor-quality fuel, ranging anywhere from 85 to 100 octane, which meant groundcrew were constantly having to adjust the 18-cylinder powerplant.

The 343rd was obliged to keep using a dwindling number of N1K1-Js to make up the numbers as it strived to perfect new tactics demanded by Capt Genda. Lt Zenjiro Miyano, commander of Sento 204th Kokutai, had recognized the strengths of the US fighter formations IJNAF pilots had begun encountering over Rabaul from late 1942. The four-aircraft division favored by the USAAF, US Marine Corps and US Navy had proven to be more effective, and dangerous, than

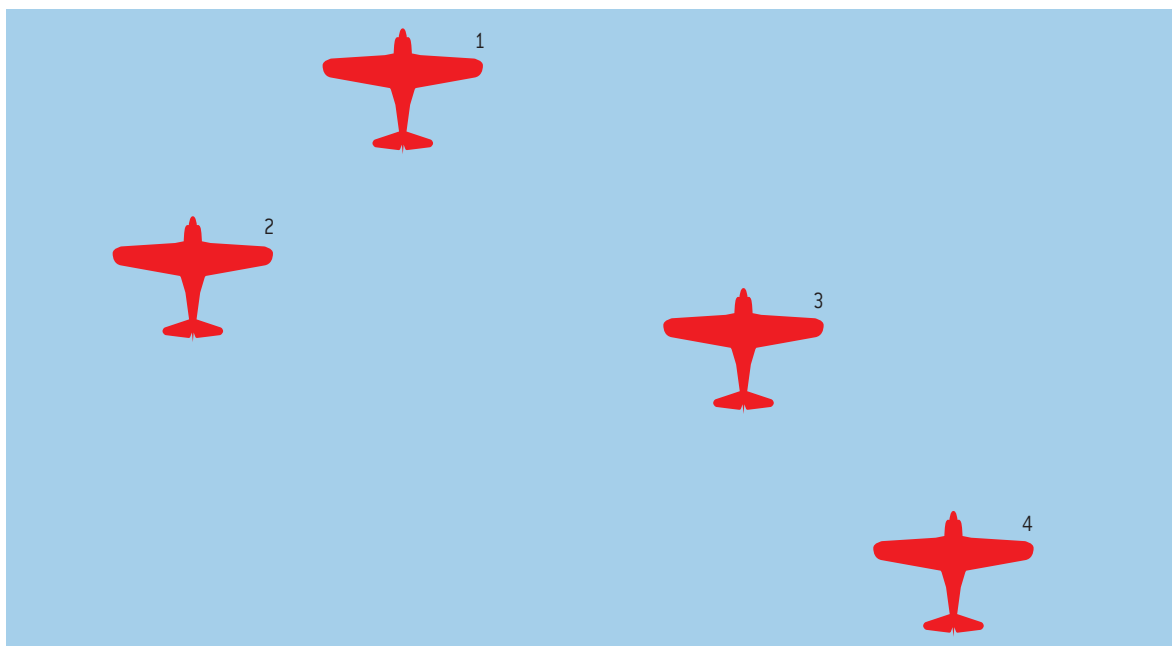
the three-fighter vic formation the Japanese had perfected in the China War and carried on into the Pacific War. It was found that in a melee, the third man was easily separated and left with no protection. Reacting to this, Miyano had become the first unit commander to adopt the four-aircraft division, in early 1943. By the time of his death in combat on June 16 that same year, Miyano had been credited with 16 victories and Sento 204th Kokutai 228 kills under his leadership.

The 343rd formulated its own tactics based on the four-aircraft division. Section leaders in the latter formation flew the first and second fighters, with the first flight being covered by the second flight. The section leader was paired with the No. 3 pilot, while the No. 2 pilot was teamed up with No. 4. Of the 120 pilots assigned to the kokutai, roughly ten per hikotai held an "A" class rating that meant they could participate in day and night operations. They were the hardcore veterans. Most pilots, however, were rated "C" class, which meant they could only perform daytime operations under the guidance of a more experienced section leader.

Capt Genda was adamant that his unit would not engage the enemy until he, Cdr Nakashima and Lt Cdr Shiga were confident that the 343rd's pilot cadre were ready to do so. "Once we had completed building up a powerful air group," Genda wrote in his memoir, "and once the fighters were launched, we intended to mow down a throng of enemy fighters like a raging wave of the sea. So I planned not to use our fighters in combat before they completed their training, in about the middle of May [1945]. That was our intention, but the enemy's plan was different."

Genda and his senior officers had formulated various intercept strategies against the anticipated carrier strikes, and war games had been played out using large maps of the area surrounding Matsuyama. The time for training ended, however, on March 18, 1945, when the 16 carriers of TF 58 sailing off the southern coast of Kyushu launched the first in a series of large-scale attacks on key military targets in western Japan.

The 343rd Kokutai adopted American fighter formations from the start, the four aircraft division that IJNAF pilots had started to encounter over Rabaul in late 1942 proving to be more effective, and dangerous, than the three fighter vic formation that the Japanese had perfected in the China War and carried on into the Pacific War. It was found that in a melee, the third man was easily separated and left with no protection. The 204th Kokutai, fighting in the Solomons, had been the first to adopt the American division in early 1943, and its use soon spread throughout the IJNAF. The 343rd formulated its own tactics based on the four aircraft division. Section leaders in such a formation flew the first and second fighters, with the first flight being covered by the second flight. The section leader was paired with the No. 3 pilot, while the No. 2 pilot was teamed up with No. 4.





# THOMAS S. HARRIS

A relatively small number of Hellcat pilots knowingly claimed victories over the Shiden and Shiden-Kai, with many more erroneously stating that they had in fact downed a "Zeke," "Tojo," "Frank" or even an "Oscar." Thomas Switzer "Tommy" Harris was among the few officially credited with destroying a "George."

Born in Tamaroa, Illinois, on April 21, 1921, Harris was a student at the University of Illinois when he decided to enlist in the US Navy on March 27, 1942. Designated a Naval Aviator at Pensacola on May 1, 1943, he completed carrier qualification on board *Wolverine* in Lake Michigan and was then posted to recently-established VF-18 in San Diego. Equipped with brand new F6F-3s, the unit was switched from CVG-18 to CVG-17 at short notice when the latter carrier air group's VF-17 was deemed unready to deploy in USS *Bunker Hill* (CV-17) due to ongoing problems with its F4U-1 Corsairs. Harris and his squadronmates sailed from San Diego for the Pacific Theater in September 1943, and subsequently participated in the invasion of Tarawa and a handful of other campaigns that saw VF-18 escorting bombers targeting Truk, New Britain and Kavieng. Harris was credited with his first aerial success on November 11, 1943, when he downed a "Val" dive-bomber during VF-18's combat debut – a multi-carrier raid on Rabaul, New Britain, that saw the unit claim 37.5 aerial victories in an eight-hour period.

Returning to the USA in the spring of 1944, Harris was transferred to the newly reformed VF-17 at NAS Alameda, California, in April, along with a number of his squadronmates. The unit steadily grew in size until January 1945, when it consisted of 72 F6F-5s and 102 pilots. It was then split in two when VBF-17 was formed, Harris remaining with VF-17. The unit embarked in USS *Hornet* (CV-12) with the rest of CVG-17 on February 1, 1945, the carrier being moored in the anchorage at Ulithi, in the Caroline Islands, at the time.

Harris and VF-17 subsequently participated in the first carrier strikes on the Japanese Home Islands and supported the invasions of Iwo Jima and Okinawa. By now a division leader and known for his "eagle eyes," he claimed a "Zeke" destroyed west of Tokyo on February 16 and two more "Zeke" kills and a third as a probable on March 18 during an attack on Yokohama airfield. He then "made ace"



Lt "Tommy" Harris of VF-17 was among the few Naval Aviators officially credited with destroying a "George," claiming one on April 12, 1945 as his ninth, and last, victory. [Author's collection]

the following day with the destruction of yet another "Zeke" and an IJAAF Ki-61 "Tony."

Harris claimed a "Tojo" destroyed on April 6 off Okinawa, before downing his final victories east of Amami Oshima six days later. Having destroyed a "Kate" kamikaze aircraft early in the mission, Harris engaged a number of N1K2-Js of the 343rd Kokutai as they attempted to defend the airfield at Kikaiga Shima from attack by VBF-17. The latter unit and VF-17 claimed 26 victories (including five "Georges") that day for the loss of a single F6F-5, Harris being credited with a "George" kill – one of five claimed by VF-17 and sister-unit VBF-17 – to take his final tally to nine.

Postwar, Harris remained in the US Navy until 1954, pursuing a career as an engineering test pilot, then served with the active Reserve until July 1959. Retiring with the rank of commander, Harris subsequently worked with North American Aviation and McDonnell, evaluating its F-101 Voodoo, F3H Demon and F-4 Phantom II fighters.



## SHOICHI SUGITA

One of only three men to achieve ace status with the N1K1/2, Shoichi Sugita was the most famous NCO pilot to transfer into the 343rd Kokutai upon its formation.

Born in a mountain village in Niigata Prefecture in 1924, Sugita abandoned his studies at agricultural school to join the IJNAF in 1940. In March 1942 he graduated from the Hei 3rd Yokaren Class and was assigned to the Zero-sen-equipped 6th Kokutai (which later became the 204th Kokutai). Making his operational debut during the Battle of Midway in June 1942, but failing to see any action during this pivotal carrier clash, Sugita was then sent to the Solomons with the 6th Kokutai. One of the youngest pilots in-theater, he soon proved his ability in combat while flying from Buin for almost a year. He rammed a B-17 Flying Fortress for his first victory on December 1, 1942 and was among six escorting Zero-sen pilots that failed to prevent Adm Yamamoto's G4M "Betty" from being shot down on April 18, 1943 – he claimed to have destroyed two of the P-38 Lightnings that attacked the formation. Sugita's luck ran out on August 26, 1943 when he was himself shot down. Bailing out badly burnt, he was flown back to Japan to recuperate.

In March 1944, Sugita was posted to the 263rd Kokutai, seeing action over the Marianas and Carolines, before transferring to the 201st Kokutai in July – he fought with this unit in the Philippines. In January 1945 Sugita was posted to the newly formed 343rd Kokutai and enjoyed notable successes with the unit's N1K2-J fighter on home defense missions and while escorting kamikaze formations during the Okinawa operation.

On April 15, 1945 he and his wingman, P02c Toyomi Miyazawa, were caught by VF-46 Hellcats in the throes of taking off from Kanoya airfield. Both pilots perished when their fighters were shot down. Sugita was posthumously



The most famous NCO pilot to transfer into the 343rd Kokutai was CPO Shoichi Sugita who, by the time he joined Sento 301st Hikotai, had claimed almost 120 victories. Credited with seven (mostly Hellcat) kills with the Shiden-Kai, he perished on April 15, 1945 when a VF-46 F6F-5 shot his fighter down shortly after taking off from Kanoya. [Author's collection]

honored with a double promotion to the rank of ensign, while his claims for the destruction of 70 enemy aircraft and shares in 40 more were confirmed in his personal commendations – he was credited with seven victories in the Shiden-Kai, most of which were Hellcats. Postwar aviation historians believe that his overall tally was more likely to have been in the 30s.

# COMBAT

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The F6F and N1K1-J engaged in combat for the first time over Formosa in October 1944, by which point the Hellcat had seen more than a year of action in the Pacific War in ever increasing numbers. The Shiden, on the other hand, had endured a protracted service entry, plagued by considerable teething troubles that included poor engine reliability and frequent undercarriage failure. Furthermore, Kawanishi had experienced problems handling aircraft production on the scale required by the IJNAF, having previously built flying boats on a considerably smaller scale.

The first unit to receive the N1K1-J Shiden was the 341st Kokutai, which had been specifically formed to fly the aircraft at Matsuyama, in the Ehime Prefecture on the island of Shikoku, on November 15, 1943. The 341st (one of four kokutais created to fly the N1K1-J within the 1st Air Fleet, itself formed on February 1, 1944) had to make do with A6Ms until the first Shidens arrived in mid-February. By then the 341st was based at Tateyama, in the Chiba Prefecture. Ongoing serviceability issues and lack of aircraft in general meant that the 341st only commenced training with the N1K1-J in June.

By July 10 the unit had sufficient Shidens on strength to create Sento 401st Hikotai and Sento 402nd Hikotai, each of which was supposed to be equipped with 48 fighters. The bulk of the pilots in the latter unit came from the recently disbanded 345th Kokutai, which had also originally been formed to fly the Shiden but had had to make do with A6Ms when production of the Kawanishi fighter fell badly behind schedule.

July 10 also saw the formation of Sento 701st Hikotai within the Yokosuka Kokutai, this somewhat nomadic Shiden-equipped unit later becoming part of the 341st Kokutai and, eventually, the 343rd Kokutai following its re-equipment with Shiden-Kais. On August 31, the 341st sent 17 N1K1-Js from Sento 401st Hikotai to Takao in an effort to bolster Formosa's meager aerial defenses. This number had been



boosted to 32 – plus 11 Zero-sens – by mid-September, although only 20 were serviceable. Sento 402nd Hikotai, meanwhile, was equipped with 30 Shidens (25 serviceable) and 22 Zero-sens at Miyazaki.

The Takao-based N1K1-Js were supposed to defend Formosa from attack by USAAF aircraft flying from the Chinese mainland, but poor serviceability meant none were intercepted. Ironically, the Shiden actually made its combat debut against carrier-based US Navy fighters when, on October 12, Hellcats from Third Fleet's TF 38 attacked targets on Formosa in a series of strikes that lasted ten days. Their aim was to prevent Japanese aircraft on the island from participating in the Battle of Leyte Gulf, scheduled to commence later that same month.

Initially, Zero-sens from the 221st Kokutai saw all of the action, with the Shidens kept in reserve until Sento 401st Hikotai CO Lt Masaaki Asakawa led seven aloft on patrol. Encountering a force of around 60 aircraft as they approached Takeo, two of the Shiden pilots used their height advantage to claim eight F6Fs destroyed between them. Four were credited to PO1c Takeo Yamada, who eventually managed to extricate himself from the action and return to base. PO1c Hideo Hirakawa was less fortunate, ramming a Hellcat after he had exhausted his ammunition downing three other F6Fs. Hirakawa, who subsequently became the only Shiden ace, was saved by his parachute. A further 14 N1K1-Js had been hastily scrambled when Asakawa's formation engaged the Hellcats, and pilots from this second group claimed a further two aircraft destroyed. The ten victories credited to Sento 401st Hikotai came at a high price, with 14 Shidens lost in return.

It is difficult to pinpoint which Hellcat units the N1K1-J pilots engaged on October 12 since no Kawanishi fighters were claimed as shot down by Naval Aviators on this date simply because the type had never previously been encountered in combat. Indeed, it was not until November 6, 1944 that a “new fighter type (VF)” was mentioned by ace Lt Albert Seckel of VF-19 in his Aircraft Action Report, the airplane being downed near Clark Field in the Philippines. There is no guarantee that this “fighter” was a Shiden either, as the J2M Raiden and Ki-84 Hayate were also engaged by Hellcat pilots for the first time during this campaign. The N1K1/2's Allied code name “George” finally appears for the first time in US Navy Aircraft Action Reports on January 3, 1945 when ace and VF-7 CO Lt Cdr Leonard Check and his wingman Lt(jg) John McIlwee both claimed one destroyed over Formosa. Check was killed the following day in a mid-air collision over Heito airfield, Formosa.

The speed and intensity of aerial combat, often against large formations of different types of Japanese aircraft, made it difficult to positively identify the airplane being attacked. During this late-war period the IJNAF fielded three radial-engined fighters – the A6M Zero-sen (“Zeke”), J2M Raiden (“Jack”) and N1K1/2-J Shiden-Kai (“George”). The IJAAF had four – the Type 1 Hayabusa (Ki-43 “Oscar”), Type 2 Shoki (Ki-44 “Tojo”), Type 4 Hayate (Ki-84 “Frank”) and Type 5 (Ki-100, which had no Allied code name).

For many US Navy pilots, the “George” was virtually an unknown type that none of them would have seen prior to the N1K1-J making its combat debut over Formosa and the Philippines in October 1944, and then only in small numbers. It was not until



Sento 401st Hikotai pilot PO1c Takeo Yamada claimed four F6Fs destroyed when the Shiden made its combat debut during the defense of Formosa on October 12, 1944. Posted to the 343rd Kokutai's Sento 701st Hikotai in early 1945, Yamada was killed dogfighting with USAAF P-47Ns on May 28, 1945. [Author's collection]



Successful VF-14 pilots pose informally on *Wasp's* flight deck following fighting over Formosa and the Philippines. Although none of them specifically claimed the destruction of a "George," it seems the six "Tojos" credited to the unit during an engagement over Formosa on October 12 were almost certainly Shidens from Sento 401st Hikotai. VF-14 lost a single Hellcat in return. (NARA)

#### OPPOSITE

Naval Aviators from VF-11 are briefed in their ready room on board *Hornet* ahead of a large-scale strike against targets on Luzon on November 5, 1944. The pilot at the extreme left in the front row is Lt Jimmie "Doc" Savage, who claimed three "Tojos" shot down over the Clark Field complex later that day. These aircraft, which gave the Texan ace status, were probably Shidens from Marcott. Sento 401st Hikotai claimed six F6Fs and two SBDs destroyed for the loss of seven N1K1-Js. (NARA)

US forces captured a handful of Shidens on and around Clark Field that the fighter's features and outlines could be clearly defined and Technical Air Intelligence Center reports and photographs issued to frontline units – the latter would have been available to pilots in TF 38/58 from early 1945.

It is not surprising, therefore, that US Navy pilots often confused N1K1/2s with more familiar types, mistaking "Franks" for "Georges" because of their superior performance, or saw any brown/green-colored Japanese fighter as an "Oscar" or a "Zeke." Understandably these young fighter pilots had more on their minds than properly identifying the airplane they were shooting at. Therefore, Aircraft Action Reports have to be approached with a degree of caution. It is sometimes possible to link

combats between Hellcat squadrons and "George" units, but not in every case.

It would appear that Sento 401st Hikotai tangled primarily with the F6F-3/5s of VF-14 on October 12, 1944, as this unit, embarked in USS *Wasp* (CV-18), claimed six "Tojos" destroyed, three damaged and one probable two miles west of Takeo, and lost a solitary Hellcat in return.

Just eight N1K1-Js remained serviceable on Formosa after this initial action, although Shiden ranks had doubled by the time Sento 401st Hikotai sortied all its available aircraft on October 14 to escort two strike forces of torpedo- and dive-bombers sent to attack TF 38. These formations enjoyed little success, with six aircraft (including a Shiden) being shot down by F6Fs – five Hellcats were claimed in return. The following day, N1K1-J numbers on Formosa were boosted by the arrival of Sento 402nd Hikotai and Sento 701st Hikotai.

On October 20, US forces landed on Leyte Island, signaling the start of the retaking of the Philippines. Two days later, 40 Shidens from the 341st Kokutai (drawn from both of its sento hikotai) and Sento 701st Hikotai flew in to Marcott – part of the Clark Field complex – on Luzon. Only 21 of these aircraft were serviceable when the 2nd Air Fleet launched more than 300 aircraft in a strike on the Fast Carrier Task Force during the Battle of Leyte Gulf on October 24. The IJNAF suffered heavy losses in the unsuccessful operation, with 11 Shidens included among the 60 aircraft shot down. Another fighter from Sento 401st Hikotai was lost 24 hours later while searching for carriers off Legaspi. On October 28, six Shidens were part of a 19-strong escort for 24 bomb-laden Zero-sens sent to attack US forces in Tacloban, the Kawanishi pilots fighting off ten F6Fs (probably from VF-13, the unit being credited with three "Oscar" and four "Zeke" victories over the "Leyte landing area," losing five Hellcats in return) and claiming one destroyed, one probable and a strafing victory without loss.

The following day carrier aircraft struck targets on Luzon, and 11 Shidens were scrambled to intercept the first wave of attackers. Six F6Fs and two SBDs were claimed shot down for the loss of six N1K1-Js. Eight aircraft from the second wave were credited to Shiden and Zero-sen pilots that doggedly defended Marcott airfield from

attack, and two F6Fs from the third wave were also credited to Shiden pilots as destroyed. The bulk of the 80 victories claimed by US Naval Aviators on October 29 fell to F6F pilots, with VF-7, VF-18 and VF-29 credited with kills over the Clark Field complex (including Marcott). The three units lost 18 Hellcats between them, however.

By October 31 there were 25 N1K1-Js at Marcott, of which 15 were serviceable. This number took a hit on November 5 when carrier-based aircraft again targeted Luzon in three waves. Shiden pilots were credited with ten F6Fs, two SBDs and two unidentified airplanes destroyed, although seven N1K1-Js were lost in return – VF-11, VF-14, VF-15 and VF-28 were the high-scoring units on this occasion. The “Sundowners” of VF-11 ended the day with 26 victories for just one combat loss following two separate sweeps of Clark Field and its outlying satellite strips. On their first wave, the unit’s pilots claimed “Tojos” and “Oscars” shot down, and on the second, “Zekes,” “Oscars” and a “Tojo.” It would seem likely that the latter two types encountered on the second sweep were probably N1K1s from Marcott. The formation had arrived over nearby Mount Arayat at about 1015hrs and, seeing several “Oscars” below, dived after them. Ace Lt Jimmie Savage, in an F6F-3, described the ensuing action:

Several Jap fighters were tally-hoed below and Lt Charlie Stimpson’s and my divisions acted as high cover while Lt Cdr Bob Clements and a division from VF-14 off the *Wasp* went down a few thousand feet and engaged them, quickly shooting down four enemy airplanes. Things were quiet after that, and Bob came back up to 15,000ft and joined Charlie and me.

We milled around awhile before I decided to make a strafing run over the field and see what would happen. Bob and his airplanes had gone up north to look over a few small fields, leaving Charlie and me at Clark. My division, composed of Lt(jg) Walter Boring, Lt Daniel T. Work and Ens John E. Olson, made the first pass, and I was surprised to see AA fire close as I entered the dive. We pulled out at 1,000ft doing some 380 knots.

Ens Olson, who had just joined my division and was on his first combat mission, reported a Jap airplane on his tail. I turned sharply away from Olson to let him pass my position, before turning back toward him and settling down behind the “Oscar.” I scared him off Olson with tracers, firing out of range. The Jap turned and twisted, diving for the deck and I followed, waiting for a good shot. He straightened out momentarily and I settled down dead astern, and just as I started firing a Hellcat came between me and the



On October 29, 1944 US Navy fighter pilots claimed 80 victories over the Clark Field complex, with VF-7, VF-18 and VF-29 all enjoying notable success, but at a price. The trio of units lost 18 Hellcats, although this VF-29 aircraft made it back to the escort carrier USS *Cabot* (CVL-28) despite being badly shot up by an enemy fighter. Sento 401st Hikotai Shiden pilots were credited with more than ten victories that day, the bulk of them Hellcats. (NARA)







China War veteran and ace Ens Akio Matsuba served with the 341st Kokutai's Sento 701st Hikotai. He claimed four Hellcats destroyed off Taiwan and over the Philippines in late 1944. He later joined the 343rd Kokutai.  
[Author's collection]

Jap in an overhead run. It was Olson. I settled down again and put the piper on the elevator and fired a good long burst. Pieces started coming off the "Oscar" and he flamed immediately, hitting the ground and disintegrating.

As he flamed I saw another "Oscar" approaching from the port beam. I turned steeply, but Lt(jg) Boring flamed him before I could get in position. As my wingman, he followed me closely. I turned back into a Jap on the starboard beam and he dove for the deck. I fired a few bursts but missed. He cut throttle, and as I overshot with my throttle all the way off I fired all the way up to his tail, and as I pulled up to miss him he exploded.

I started for the rally point but was jumped by two more from above. I got a 90-degree shot at one but missed. The other turned away as if to run, and I jumped on his tail and finally shot him down after a chase at treetop level down a road near Clark Field. I again started for the rally point and made a run on another "Oscar" and fired all my ammo without seeing him go down. I quickly turned my and Charlie's division around and headed for home.

On November 13, three more F6Fs fell to the Shiden's guns, but six Kawanishi fighters were in turn shot down and six more destroyed on the ground. By this time Sento 701st Hikotai had been transferred to the 341st Kokutai, and one of its more successful pilots from this particularly trying period was ace Ens Akio Matsuba, who claimed four Hellcats destroyed off Taiwan and over the Philippines. He later joined the 343rd Kokutai.

Outnumbered whenever it ventured into the air and hamstrung by the continued unserviceability of its dwindling number of Shidens, the 341st was also forced to "volunteer" six pilots for Tokko Special Attack Units mounting suicide missions against naval vessels off Leyte. The kokutai moved to Mabalacat airfield shortly thereafter, its trio of sento hikotai now led in the air by ace Lt Iyozo Fujita. In December at least seven Shiden pilots were killed during interceptions overhead Luzon, including PO1c Hideo Hirakawa on the 23rd. Attacking USAAF bombers over Manila, he perished when his N1K1-J collided with his target. This final victory took Hirakawa's tally to five, making him the only known Shiden ace.

From mid-December the few surviving N1K1-Js were increasingly used as fast reconnaissance aircraft. Indeed, future 343rd Kokutai pilot Lt Takuo Mitsumoto frequently spotted US Navy carriers sailing off Luzon. The final four airworthy N1K1-Js were flown to Tuguegarao, in Cagayan province, on January 9, 1945, and they too were soon lost attacking shipping in the Lingayen Gulf. The 341st Kokutai's surviving Shiden pilots were flown back to Formosa, but its groundcrews were left in Luzon to fight on to the death.

Between October 24, 1944 and January 10, 1945, Shidens flew 303 sorties (compared to 1,049 by A6Ms) in the Philippines. Between them, Shiden and Zero-sen pilots had claimed 120 US aircraft shot down and 60 destroyed on the ground. The vast majority of these had fallen to aviators flying A6Ms. The precise number of N1K1-Js downed by Hellcat pilots during the fighting over the Philippines is difficult to calculate due to the misidentification of the type in the heat of battle.

## HOMELAND DEFENSE

The IJNAF received a further 112 Shidens during 1945, and they were used in ever diminishing numbers by a handful of units during the ill-fated defense of the Home Islands. The first to see action with the Shiden over Japan was the 210th Kokutai, which had been formed at Meiji, near Nagoya, as a composite training unit equipped with different types of aircraft. Flying no fewer than 31 Shidens, the buntai (flight) assigned these fighters was primarily involved in intercepting B-29s when they began attacking targets in Japan.

Fellow training unit the Tsukuba Kokutai was equipped with a small number of Shidens in early 1945 and these were involved in clashes with US Navy aircraft attacking the Kanto Plain in February. The first of these engagements occurred on the 16th when mixed formations of Zero-sens and Shidens clashed with Hellcats on three separate occasions. One F6F was claimed destroyed and three damaged, with one of the latter credited to CPO Tomeshiro Hiro who later transferred to the 343rd Kokutai. A single Shiden and five Zero-sens were lost in return, and there were no serviceable N1K1-Js available to participate in the final mission of the day. The only pilot to specifically claim a “George” shot down in his Aircraft Action Report on February 16 was Lt(jg) Rolan Powell of VF-3, who had engaged the fighter northeast of Tokyo.

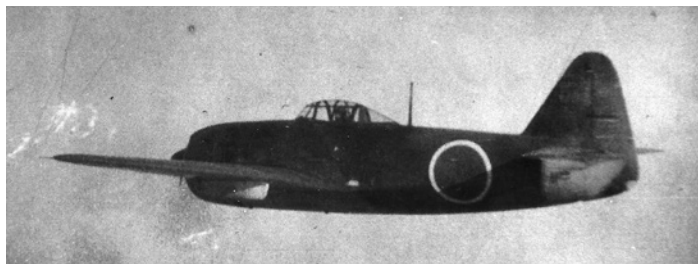
A handful of N1K2-Js were also involved in the fighting over Kanto Plain that day, the Shiden-Kai making its combat debut in the hands of veteran aces serving with the Air Arsenal and the Yokosuka Kokutai. The first pilot credited with a victory in the new fighter was Ens Matsuo Hagiri of the Yokosuka Kokutai. An engineer by trade, Hagiri was highly valued within the unit for his analytical mind and immense physical strength – he once endured 9.5g in a test dive without blacking out.

During the late morning of February 16, the Air Arsenal and Yokosuka Kokutai scrambled a mixed formation of at least ten fighters – A6Ms, J2Ms and N1K2-Js – from Oppama. Among the pilots at the controls of the Shiden-Kais were Lt Shigehisa Yamamoto (the type’s chief test pilot at the Air Arsenal) and 17-victory ace CPO Masao Masuyama. Veteran aviator PO1c Shin-ichi Hirabayashi was in another Shiden-Kai, flying as wingman for Ens Matsuo Hagiri. The pilots circled over Atsugi waiting for the low-flying carrier aircraft to appear from the southeast, and once they had spotted their foes, they employed “dive and zoom” tactics developed by the Yokosuka Kokutai. Hagiri claimed an F6F destroyed for his 13th, and last, success.

Fellow Yokosuka Kokutai Shiden-Kai pilot, and 23-victory ace, Ens Kaneyoshi Mutoh took off after the main formation, although he quickly made up for lost time. A veteran of combat in China, the



An instructor from the Tsukuba Kokutai runs his Shiden's Homare engine up while groundcrew keep a weather eye on the aircraft's fragile undercarriage legs. The training unit was equipped with a small number of N1K1-Js in early 1945, and these were involved in clashes with US Navy aircraft attacking the Kanto Plain in February. [Author's collection]



Yokosuka Kokutai ace WO Ryoji Oh-hara goes in search of enemy aircraft during a patrol over the Kanto Plain in early 1945. [Author's collection]



Ens Kaneyoshi Mutoh was one of only three pilots to achieve ace status with the Shiden-Kai, four of his kills (all F6Fs from VF-82) being claimed on February 16, 1945, shortly after fellow Yokosuka Kokutai instructor Ens Hagiri had claimed his solitary success with the airplane. Mutoh was killed during his first 343rd Kokutai combat mission.  
[Author's collection]

Philippines, the Dutch East Indies, the Solomons, eastern New Guinea and, most recently, Iwo Jima with the Yokosuka Kokutai, he single-handedly engaged 12 F6Fs over Atsugi. These aircraft were probably from VF-82, embarked in USS *Bennington* (CV-20), which lost six Hellcats in combat over Honshu on this date. Mutoh claimed to have destroyed four aircraft with only short bursts of fire. His success was widely reported in the Japanese press, Mutoh's feat being compared to the actions of Musashi Miyamoto, a famed swordsman of the early 17th century, at the Battle of Sagari-matsu.

Overall, the Air Arsenal and the Yokosuka Kokutai pilots claimed 13 enemy aircraft destroyed and a further six probably shot down on February 16, for the loss of CPO Mitsugu Yamazaki's aircraft, although he bailed out and landed safely. Shortly thereafter he was mistaken for a US pilot and beaten to death by irate civilians. From then on, IJAAF and IJNAF airmen made certain that a small hinomaru was sewn onto their flight suits and helmets.

## COMBAT FOR THE 343rd KOKUTAI

As noted, the 343rd Kokutai was unique within the IJNAF as an "elite" unit formed by Capt Minoru Genda and staffed, in the main,

by veteran pilots handpicked by him and his immediate subordinates. Slated to be equipped with the brand new Shiden-Kai, the kokutai initially consisted of Sento 301st Hikotai, Sento 701st Hikotai and Sento 407th Hikotai. It was later joined by Sento 401st Hikotai (which became a training unit) and Sento 402nd Hikotai (subsequently transferred to the 601st Kokutai) following their return from the Philippines.

The 343rd was still in the process of converting from the Shiden to the Shiden-Kai when it made its combat debut over the Inland Sea on March 19, 1945, opposing TF 58 aircraft sent to bomb Kure. The kokutai scrambled no fewer than 72 fighters, although only seven were N1K1-Js.

Genda had drilled his pilots ceaselessly since the formation of his kokutai, emphasizing formation tactics above all. He knew the Shiden's inferior performance (slower rate of climb and top speed), lighter armament and shorter range compared to the Shiden-Kai meant the two aircraft could not fly formation tactics together. He therefore decided he would use eight N1K1-Js as cover for the Shiden-Kais. Sento 407th Hikotai and Sento 701st Hikotai would each contribute four aircraft, led by Lts Goro Ichimura and Ryoichi Yamada, respectively. The latter had volunteered to fly a Shiden because no one else wanted to, and because he was familiar with the difficult-to-control fighter following his service with Sento 402nd Hikotai in the Philippines.

The 343rd knew that TF 58 was coming, for US Navy aircraft had hit targets in Kyushu the previous day. On the morning of March 18, the 16 carriers of TF 58 sailing off the southern coast of Kyushu had launched their attack. The vessels' presence came as no surprise to the IJNAF, since Japanese radar and patrol aircraft had detected them. Tasked with knocking out airfields on Kyushu that might be used as staging areas for kamikaze units in advance of the amphibious assault on Okinawa,



hundreds of US Navy aircraft strafed and bombed bases in a series of attacks that resulted in US pilots claiming 102 Japanese airplanes shot down and 275 destroyed on the ground.

Targets – primarily Japanese naval vessels, including the battleship *Yamato*, in and around Kure harbor – for March 19 were chosen following the debriefing of reconnaissance pilots that had flown over the areas hit on the 18th. The official history of TF 58 notes:

Commander Task Force 58 decided to attack a large number of major fleet units the following day, with the harbor installations at Kure and Kobe as alternate targets. Fighter sweeps against intervening airfields on Shikoku and western Honshu were to precede and follow these strikes.

By the early morning of the 19th, TF 58's carriers had repositioned themselves east of Kyushu and south of Shikoku. While US Navy pilots conducted their final pre-mission briefings and their aircraft (more than 300) were prepared for a dawn launch, Capt Genda addressed his pilots at Matsuyama at 0500hrs:

The enemy's invasion is inevitable this morning. We are going to intercept the enemy aircraft and deal a severe blow to them. Our target is the enemy's fighter force. Do not give your eyes to bombers – ignore them. Try to shoot down as many of the enemy fighters as possible!

He dispatched three C6N Saiun reconnaissance aircraft 40 minutes later to find the carrier force and radio back its position. At 0630hrs Genda ordered seven Shiden pilots to take-off and circle the airfield at 16,400ft. It would be their job to protect Matsuyama long enough for the 56 Shiden-Kais to get into the air safely. Each Shiden would be equipped with a belly tank in order to increase its endurance. This would be the first – and the last – day that the 343rd Kokutai would fly the N1K1-J in combat. Lt Ichimura was fully aware of the gravity of his mission:

The result of our training for the past few months would be proven in a few hours. It was up to Lt Yamada and I, with two four-aircraft divisions codenamed *Hayate* [swift wind], to do our duty.

Although Ichimura and his three pilots took off without problem as dawn drew near, the right gear leg of Yamada's aircraft broke while he was taxiing. It was a common occurrence that plagued the Shiden



A VF-82 F6F-5's engine is run up to full power on *Bennington*'s flight deck moments before launching on a mission in February 1945. The unit lost six Hellcats in combat over Honshu on February 16, VF-82 having probably clashed with the veteran fighter pilots of the Yokosuka Kokutai. [NARA]

Lt Goro Ichimura had flown J2M Raidens with the 302nd Kokutai prior to being posted to the 343rd Kokutai's Sento 407th Hikotai. He was one of seven pilots from the 343rd to enter combat in the Shiden on March 19, 1945, these aircraft acting as cover for the 56 Shiden-Kais sent aloft from Matsuyama to defend Kyushu. [Author's collection]





Sento 407th Hikotai's Lt Ryoichi Yamada was also at the controls of a Shiden on March 19, having become accustomed to flying the tricky fighter during his service with Sento 402nd Hikotai in the Philippines. He needed all his experience to survive a seven-minute dogfight with two Corsairs overhead Matsuyama airfield, the Shiden being hit numerous times and Yamada eventually having to belly land the battered fighter. [Author's collection]

**OPPOSITE** Hellcats from *Intrepid* and *Bennington* and other TF 58 carriers targeted Kure harbor on March 19, 1945 in a series of attacks. The flightpath for the main group force passed just to the east of Matsuyama airfield, home to the 343rd Kokutai. This unit would later fly from Kanoya and Omura when supporting kamikaze operations to Okinawa.

throughout its short service career and Yamada abandoned the aircraft to requisition his No. 3 pilot's fighter. Although he was now a pilot short, Yamada was not overly concerned for the odd man out in the formation, CPO Takumi Sugitaki, since he was a combat veteran.

At 0650hrs Genda received a wireless message from one of the Saiuns, indicating that it had found TF 58. The carrier aircraft would have to pass almost directly over Matsuyama on their way to and from Kure. Genda ordered his pilots to start engines and take-off – the Shiden-Kais from Sento 301st Hikotai, Sento 407th Hikotai and Sento 701st Hikotai took off in seven line-abreast formations of eight aircraft one after another, the scramble being over within ten minutes. The first wave of US Navy aircraft, approaching Shikoku and Kyushu from two directions, was less than 80 miles away. All the 343rd fighters committed to the mission were now airborne and climbing hard to get above the enemy formations. There were at least seven aces aloft in N1K2-Js.

With their airfield protection detail over, the Shiden pilots were ordered to follow their respective units into battle. Some 3,300ft above the climbing Shiden-Kais, Lts Yamada and Ichimura spotted the approaching Hellcats first. These machines belonged to VBF-17, embarked in USS *Hornet* (CV-10). Slashing through 20 F6F-5s, the Sento 407th Hikotai shot down or disabled half of the formation. Ichimura arrived on the scene moments later:

I hurried into battle, joining the combat. After that, I did not know what I was doing! The white star markings on one wing and the white lines on the other wing for identification persistently came into sight one after another. Each time we closed in, tracers from our four 20mm cannon crossed with those from the Americans' 13mm guns.

Lt Yamada's division was behind and above Sento 701st Hikotai, providing it with top cover as the Shiden-Kais targeted VBF-17:

I hurried to a position straight above the combat, which by now had turned into a melee. I watched and found Shiden-Kais hunting down the Grummans. As the zone of combat expanded, some of the Grummans were forced to get out of it. Once getting out of the zone, they could possibly regroup and come back with full advantage. I immediately knew that my duty was to hit such aircraft like swatting flies with a swatter, and began maneuvering to attack a four-aircraft Grumman formation. I concentrated my energy and started my attack run, closing to within 330ft of the tail of one of the Grumman fighters. He had not noticed me yet. I got so near that I needed no gunsight, pressing the firing button on the throttle lever. Within half a second the Grumman had caught fire. I gave him another burst for a quarter of a second. His wing flew off. The stout-looking Grumman banked. The power of the 20mm cannon was great. My wingman [CPO Takumi Sugitaki] shot down another Grumman, too. It was a key to victory in formation fighting to prevent enemy attacks while another section engaged.

Having not seen any action in several months, the veteran aviators of the 343rd were keen to test their new fighters in the crucible of aerial combat. Enjoying a height







VBF-17's Lt Fred Prinz crash-lands back on board *Hornet* after his F6F-5 was hit hard in the port wing by cannon rounds fired by the N1K2-J of Lt Takashi Oshibuchi during the Kure strike on March 19, 1945. The Hellcat's guns were rendered inoperable and its hydraulic system badly damaged by the well-aimed burst of fire. (NARA)

The destructive power of the N1K1/2-J's 20mm cannon is graphically illustrated by this photograph of a VBF-85 Corsair damaged in combat with a Shiden-Kai on June 2, 1945. Multiple Type 99 weapons equipped most late-war Japanese fighters. (NARA)



advantage, and with the sun at their backs, they dove on formations of Hellcats from VBF-17. As they had been taught, the Shiden-Kai pilots, led by Sento 701st Hikotai squadron leader Lt Takashi Oshibuchi, made two-aircraft section attacks from above, then recovered together and climbed back up to the rest of their formation in order to retain their height advantage, before attacking again. Within minutes the US Navy fighter pilots realized that their adversaries were skilled and dangerous – this was not going to be a repeat of the Marianas Turkey Shoot.

The VBF-17 division led by Lt Charles Weiss took the brunt of the attack, the Naval Aviator subsequently recalling, "I met the first one [two-aircraft section] that came down knifing through us. From then on, it wasn't like any dogfight I've ever been in. It was just a big swarm, like a giant hornets' nest. My belly tank caught fire and I had holes in my fuselage and wings. I released the belly tank and dove to extinguish the fire." Moments later, Weiss opened fire on a Shiden-Kai that was diving on him from above. "I was getting hits on him and he was getting hits on me!" he recalled. The two fighters then clipped wings and Weiss was thrown clear of his Hellcat, parachuting into captivity.

Leading the way, Takashi Oshibuchi claimed two victories and his wingman, CPO Kikuichi Ishikawa, one, before the latter was killed – possibly in the collision with Weiss. Second element leader Ens Akio Matsuba also downed two Hellcats prior to his fighter being shot up. The third element was credited with three victories, but its leader, Lt Kunio Matsuzaki was killed, as was his counterpart in the fourth element, Lt(jg) Yukihiro Watabe.

Just as he was about to follow Oshibuchi and Sento 701st Hikotai into combat, Lt Yoshishige Hayashi, leading the Sento 701st Hikotai formation of 16 Shiden-Kais, received an urgent radio call that Matsuyama was about to be attacked by Hellcats. Realizing the airfield was without fighter cover (the seven Shidens had by then joined up with their respective units), he led his unit back. Six VF-83 F6Fs were engaged head-on at an altitude of 10,000ft directly overhead the airfield, ace CPO Mitsuo Hori watching the action from the ground:

My heart swelled with pride when I saw 16 of our fighters racing back to the airfield. No sooner had both formations clashed when an aircraft flamed and fell. It was a stumpy-looking machine. We got it! A Grumman was going down! Victory! Excited shouts of joy whooped around the squadron's command hut. The combat was going to be won by our Shiden-Kais! A total of more than 40 friendly and enemy aircraft fighters had engaged. Again, another Grumman went down trailing smoke.

Lt Hayashi was soon forced to leave the melee after his undercarriage lowered unexpectedly and he could not retract it. Managing to avoid the numerous Hellcats in the area, he fled towards Iwakuni airfield. During his postwar interrogation, Capt Genda commented on the undercarriage problems that proved to be the Shiden-Kai's most serious failing in combat:

It was very poor – much worse than on the average Japanese aircraft. When dive-bombing or strafing, if the aircraft reached 420mph, the gear was apt to fall apart in the air. About a quarter of the pilots we lost in combat were lost for this reason. The Shiden-Kai got to be a better airplane toward the end, however.

On a more positive note, the 20mm Type 99 cannon had proven itself a deadly weapon. Ens Matsuba, who claimed two successes prior to his fighter being shot up, reported to Genda that the power of the cannon was “enormous,” stating “if our range is right the enemy can be knocked out with one burst.” VBF-17 had indeed felt the full force of the Shiden-Kai's powerful battery of four cannon, having nine fighters destroyed. The unit's mission report for March 19 reflected the high caliber of the opposition it had faced over Shikoku:

It was the opinion of the more experienced pilots of this squadron, who participated in this melee, that the Jap pilots encountered here were superior to those met in the Tokyo area. They handled their aircraft well, were exceedingly aggressive and exhibited good organization, discipline and tactics. Their tactics were similar to those of the US Navy. They appeared to be well trained and experienced in combat flying.

Overall, claims by the 343rd Kokutai and pilots from TF 58 were very similar – the former tallied 52 aerial victories (two of which were credited to Shiden pilots) and the latter 63 kills. Both totals reflected the usual overclaiming due to confusion in the heat of battle. TF 58 actually lost 14 fighters (ten of them from VBF-17), including aircraft disposed of after returning to their carriers too badly damaged to be repaired. The 343rd suffered 15 fighters shot down and 13 pilots killed in aerial combat, with four more (including aces Lt Naoshi Kanno and Ens Akio Matsuba) wounded. Although last into combat, Kanno's Sento 301st Hikotai had been credited with the most victories, including nine to CPO Katsue Katoh – this tally was revised to four destroyed and a probable. Squadronmate CPO Shoichi Sugita demonstrated that he had lost none of the flying skill that had made him a high-scoring ace by downing three enemy fighters.

## KAMIKAZE ESCORTS

The 343rd Kokutai next experienced significant action while trying to defend aircraft carrying out suicide attacks on US Navy vessels supporting the amphibious landing on Okinawa, which commenced on April 1. For this operation, the unit was transferred from the 3rd Air Fleet to the 5th Air Fleet on the very day of the invasion. The kokutai's primary mission was to open the air corridor for the flow of kamikaze aircraft heading southwest to Okinawa. This new assignment also meant that Shiden-Kai pilots had to embark on very long-range missions, flying from Kanoya to

### OVERLEAF

On the morning of March 19, 1945, the veteran aviators of the 343rd Kokutai saw combat for the first time in the N1K2-J. Enjoying a height advantage, and with the sun at their backs, they dove on 20 Hellcats from VBF-17 that were targeting airfields in the Kure area. The US Navy pilots in turn started to climb in their F6F-5s in order to meet their opponents head on. In the vanguard of the attack was Sento 701st Hikotai squadron leader Lt Takashi Oshibuchi and his wingman CPO Kikuichi Ishikawa, and they claimed three Hellcats destroyed in their opening pass. They had targeted the VBF-17 division led by Lt Charles Weiss, whose fighter was badly shot up prior to it colliding with an N1K2-J – possibly the aircraft flown by CPO Ishikawa, who was killed. Weiss parachuted into captivity. Oshibuchi's cannon rounds hit Lt Fred Prinz's F6F-5 in the port wing, although he managed to limp back to *Hornet* and successfully crash-land. His wingman, Lt [jg] Roger W. Karr, was not so lucky, being posted Missing in Action after he too was almost certainly hit by Oshibuchi.







*Hector*



Amami-oshima and back. The one-way distance was more than 240 miles and these missions lasted in excess of two hours. Furthermore, pilots only had sufficient fuel for a maximum of 15 minutes' combat at full power.

On April 12, just 48 hours after the last Shiden-Kai reached the unit's new airfield at Kanoya from Matsuyama, the 343rd attempted to sortie 44 aircraft on an escort mission, although its groundcrew struggled to get anywhere near this number aloft due to poor-quality fuel. As the formation neared the island of Kikaiga Shima, located midway between Kyushu and Okinawa, the 343rd pilots saw that its airfield was coming under attack by Hellcats – these aircraft were again from VBF-17, which the kokutai had badly mauled on March 19. Lt Kanno, leading the 343rd, dove headlong after several Hellcats in the midst of their strafing run. Ace CPO Tomokazu Kasai, flying as wingman to fellow ace CPO Shoichi Sugita in Kanno's division, tried to follow the latter, who, as per usual, did not wait for his men.

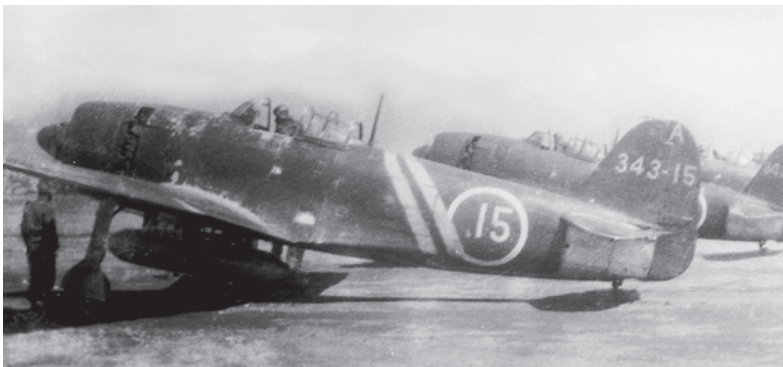
"Lt Kanno fired a burst at the enemy's first aircraft," Kasai recalled many years later. "Suddenly it drew white smoke and nosed straight down. In succession, the second aircraft fell with white smoke as well." Hearing the distress calls from the Hellcats under attack, the remaining two divisions of F6Fs then climbed up to meet the N1K2-Js. Two Shiden-Kais soon fell, and Kasai knew he could well be next:

Fighters began to fall here and there. I could not see which aircraft they were, but they looked to be friendly. I wouldn't be defeated! I wouldn't become separated from my formation. Then, abruptly, CPO Sugita rolled and dived down. Immediately, I followed him. Looking ahead, an F6F was seen. He was in my gunsight. Right at that moment I forgot that I was to maintain formation with my section leader. I fired my four 20mm guns. The vibration was pleasant. Tracers were absorbed into the enemy aircraft. I did it at last! He began trailing black smoke and went down. Immediately, I followed him. Then I realized that I was alone and looked for CPO Sugita, but he was nowhere to be seen. I had gone too far! We were not allowed to leave the formation. Formation fighting was Capt Genda's principle, but I had ignored it.

I looked around, but I saw only enemy fighters everywhere. Then I saw three enemy aircraft below. They were at a position suitable for an attack from behind and above. I dived down right away and closed on the first aircraft to about 50m. I squeezed the firing button. I saw the pilot lean backwards and then fall forward in the cockpit. I continued to engage the second aircraft. I caught him in the gunsight and squeezed the button again, but my

guns did not fire! Realizing that I was now defenseless, I dived. When I pulled up, I was almost on the deck, so I fled. I looked up and saw two F6Fs chasing me. I crept along, skimming the sea. The enemy aircraft suddenly became four. They were persistent, and I was determined to ram them if they attacked me. One of them started to smoke and the remaining three then pulled away.

Sento 301st Hikotai Shiden-Kai "343-A-15" was photographed at Matsuyama airfield on April 10, 1945 just prior to the unit departing for its new base at Kanoya. Lt Naoshi Kanno had this aircraft specially marked with command stripes in the hope they would attract the attention of enemy airplanes. Although he flew this machine on a number of occasions, as with other IJNAF units, the 343rd's pilots took whichever aircraft was available. Poor-quality fuel caused maintenance problems, making the assignment of individual fighters all but impossible. Nevertheless, aircraft marked with command stripes were usually reserved for flight commanders. (Author's collection)





# F6F-5 HELLCAT COCKPIT



- |  |   |   |                                     |
|--|---|---|-------------------------------------|
| 1. Upper left cockpit light                | 19. Oil dilution switch                   | 37. Radio controls                                | 55. Landing gear control            |
| 2. Rudder trim tab control                 | 20. Propeller pitch vernier control       | 38. IFF destruction switch                        | 56. Altimeter                       |
| 3. Cowl flaps control                      | 21. Engine control quadrant friction knob | 39. Carburetor protracted air control             | 57. Rudder pedals                   |
| 4. Oil cooler/intercooler shutters control | 22. Auxiliary electric fuel pump switch   | 40. Ignition switch                               | 58. Airspeed indicator              |
| 5. Droppable fuel tank release switch      | 23. Cabin sliding hood control            | 41. Clock   | 59. Gun charging controls           |
| 6. Mask microphone switch                  | 24. Battery switch                        | 42. Landing gear emergency control                | 60. Cockpit heater control          |
| 7. Throttle control                        | 25. Main electrical distribution panel    | 43. Directional gyro                              | 61. Turn and bank indicator         |
| 8. Mixture control                         | 26. Electrical light panel                | 44. Compass                                       | 62. Ammunition rounds counter       |
| 9. Wing flap electrical switch             | 27. Radio controls                        | 45. Mk 8 electric gunsight                        | 63. Fluorescent lights control      |
| 10. Supercharger control                   | 28. Recognition lights                    | 46. Attitude gyro                                 | 64. Rate of climb indicator         |
| 11. Water injection control switch         | 29. Hand pump selector valve              | 47. Chart board light                             | 65. Wing lock safety control handle |
| 12. Elevator trim tab control              | 30. Aft right cockpit shelf light         | 48. Attitude gyro caging knob                     | 66. Manifold pressure gauge         |
| 13. Aileron trim tab control               | 31. Manual reset circuit breaker panel    | 49. Tachometer                                    | 67. Chart board [retracted]         |
| 14. Fuel tank pressurizing control         | 32. Access to reverse current relay       | 50. Water quantity gauge [A.D.I. System]          | 68. Oil temperature gauge           |
| 15. Propeller pitch control                | 33. Hydraulic hand pump                   | 51. Instrument panel fluorescent light            | 69. Fuel pressure gauge             |
| 16. Fuel selector valve dial               | 34. Armament panel                        | 52. Cylinder head temperature gauge               | 70. Fuel quantity gauge             |
| 17. Reserve fuel tank pressurizing control | 35. Hand microphone                       | 53. Oil pressure gauge                            | 71. Control column                  |
| 18. Fuel tank selector valve control       | 36. Pyrotechnic cartridge clips           | 54. Landing gear and wing flap position indicator | 72. Seat                            |

Although initially facing just VBF-17, the 343rd had soon been engaged by VF-17 Hellcats and VMF-112 Corsairs – the kokutai eventually took on an estimated 80 fighters. Outnumbered, the 343rd suffered heavy casualties, with nine pilots from Sento 301st Hikotai and one from Sento 701st Hikotai killed in what turned out to be something of a “turkey shoot” by US standards. In return, the 343rd was credited with 20 Hellcats and three Corsairs destroyed. Only a fraction of this number had in fact been lost, with a VBF-17 F6F-5 and a VMF-112 FG-1D eliminated. Sugita, who returned to Kanoya in a badly shot-up Shiden-Kai minus its canopy, claimed two Hellcats and a Corsair destroyed and a second F4U-1D as a probable. Kasai also claimed two F6Fs, but Sugita questioned the veracity of these kills and Kasai amended his victories to probables. Fellow aces Naoshi Kanno and Mitsuo Hori were among the pilots making single kill claims.

In their post-mission reports, US Navy and US Marine Corps pilots involved in this fierce engagement noted that their opponents were flying well-armored airplanes that “were hard to burn due to their armor plating and self-sealing tanks.” It was also stated that the IJNAF fighters were fitted with 20mm cannon only – “there were no small-caliber guns.” Although both Corsair and Hellcat pilots acknowledged that the Shiden-Kai could out-turn them, the Japanese pilots were criticized for their lack of organized tactics. Naval Aviators from VF-17 also noted that the enemy fighters had excellent climbing characteristics and superior speed, and when confronted with Hellcats on their tails, the Japanese pilots would snap-roll to the left – their automatic combat flap system saved them time and time again.

On April 15, the US Navy targeted Kanoya and nearby Kushira airfields for destruction, since both had been identified as key staging areas for kamikaze missions. Japanese radar detected the approaching raid and Capt Genda ordered an immediate scramble in the belief that he still had ample time to get aircraft safely aloft. However, 28 Hellcats from VF-46 (embarked in USS *Independence* [CVL-22]) and VF-12 (flying from USS *Randolph* [CV-15]) arrived over Kanoya much sooner than Genda had expected. He quickly ordered the scramble aborted. One of the pilots already in the cockpit was CPO Tomokazu Kasai:

At the warning “Enemy formation sighted, heading north for Kanoya,” the four pilots in my division started the engines of their fighters. There was almost no time for a warm-up. The first and third aircraft raised violent smoke and dust. CPO Sugita looked back from his cockpit and pointed upward and had begun to take off when seven or eight Grummans dived in a strafing run at his aircraft. I was stunned. Just as I signaled for the wheel chocks to be removed a rocket hit the wing of my fighter and blew a big hole in it.

Leading the attack was the CO of VF-46, Lt Cdr Robert “Doc” Weatherup, who consistently achieved the best air-to-air gunnery scores in his squadron:

As we approached Kanoya I could see several aircraft taxiing and apparently preparing to take off. I decided to attack the airfield. I picked out an aircraft (or a decoy) in a revetment and fired my rockets at it and then strafed until I had to start my pull-out. As I was getting level again, I saw that two aircraft were starting their take-off runs. I decided to take the lead aircraft, but I was forced to pull pretty hard in a high turn of



# N1K2-J SHIDEN-KAI COCKPIT



- |                                 |  |  |                                   |
|---------------------------------|--|--|-----------------------------------|
| 1. Starter fuel tank dump lever | 14. Cylinder temperature gauge             | 25. Altimeter                          | 36. Rudder pedals                 |
| 2. Manual fuel pump             | 15. Tachometer                             | 26. Clock                              | 37. Pilot's seat adjustment lever |
| 3. Fuel tank selector           | 16. Oil pressure gauge                     | 27. Air temperature gauge              | 38. Pilot's seat                  |
| 4. Propeller pitch control      | 17. Boost gauge                            | 28. Water/methanol pressure gauge      | 39. Control column                |
| 5. Cockpit red light            | 18. Exhaust temperature gauge              | 29. Landing gear position indicator    | 40. Cold air vent                 |
| 6. Throttle lever               | 19. Compass                                | 30. Vertical speed indicator           | 41. Oil temperature gauge         |
| 7. Wing fuel tank selector      | 20. Turn indicator                         | 31. Oil cooler shutter control         | 42. Canopy crank                  |
| 8. Wing fuel tank gauge         | 21. Navy Type 4 reflector gunsight Model 1 | 32. Pressure pump switch               | 43. Main circuit breaker panel    |
| 9. Fuselage fuel tank selector  | 22. Artificial horizon                     | 33. Propeller de-icer anti-freeze pump | 44. Combat flap control           |
| 10. Fuel indicator light        | 23. Navigation gauge                       | 34. Manual hydraulic pump              | 45. Heated flight suit switch     |
| 11. Fuselage fuel tank gauge    | 24. Airspeed indicator                     | 35. Fuel injection pump                | 46. Elevator trim wheel           |
| 12. Magneto switch              |  |  | 47. Rudder trim control           |
| 13. Oxygen regulator            |  |  |                                   |





VF-46 C0 Lt Cdr Robert "Doc" Weatherup led 28 F6F-5s on a sweep of Kanoya airfield on April 15, 1945, catching the 343rd Kokutai by surprise. Arguably the best shot in his unit (he attributed his fine shooting eye to years of pheasant hunting as a teenager), Weatherup quickly despatched two "Georges" that were in the throes of taking off, killing high-scoring ace CPO Shoichi Sugita and his wingman PO2c Toyomi Miyazawa. Weatherup described his victims as "Single-Engined Aircraft" in his Aircraft Action Report. [NARA]

nearly 270 degrees to get on his tail. By this time the lead aircraft was probably at about 400ft and starting a slight turn. I decided to take the first aircraft, thinking that it was probably flown by a senior flight leader, and that their formation might fall apart without him. I also presumed that some of my other aircraft would take the following fighter.

At first I had a little too much lead, and the target aircraft apparently saw my tracers and relaxed his turn. Almost immediately I started to see "flicks" where my bullets were hitting armor or heavy structure. Soon thereafter, the target aircraft started to nose over. I continued to fire until I had to pull up. The target aircraft did not burn until it crashed, although there may have been a little smoke.

CPO Shoichi Sugita, the legendary "King of Aces" who had been in constant action since mid-1942, was killed instantly when his fighter crashed. Capt Genda, Lt Cdr Shiga and Ens Sakai witnessed his demise, as did CPO Kasai. "An incredible

scene came into my eyes," the latter recalled. "At a burst from a Grumman, Sugita's aircraft banked abruptly and crashed. Black smoke rose into the air from the end of the airfield." Moments later, Weatherup also downed Sugita's wingman, PO2c Toyomi Miyazawa, whose fighter sustained many hits but did not burst into flames. Instead, it dropped from 800ft into a pine forest east of the airfield.

The combat experience of the 343rd Kokutai in the handful of engagements it had fought since March 19 had starkly revealed that even with good leadership, experienced aviators (the unit-wide average was 500 hours of flying time per pilot) and a superb fighter, one kokutai could do little to stem the Allied tide of destruction now washing over the Home Islands of Japan. US radar-directed CAPs, an overwhelming number of Hellcats and Corsairs, and excellent enemy radio communication were costing the IJNAF dearly.

During the morning of April 16, the 343rd again supported the kamikaze offensive against Allied warships off Okinawa, attempting to clear a path through US fighter cover for the highly vulnerable Tokko aircraft heading south. As the IJNAF pilots approached their destination at 19,500ft, unbeknownst to them their progress had been monitored for the previous 30 minutes by US radar. A large number of Hellcats from VF-17 and VF-47, the latter embarked in USS *Bataan* (CVL-29), were duly vectored to meet them, approaching the Shiden-Kai formation with a height advantage.

Despite having no fuel reserves, and operating at the very limit of their range, the 343rd pilots engaged the enemy fighters as they had been ordered to. Thirteen-victory ace WO Isamu Miyazaki of Sento 301st Hikotai was one of the first pilots to see the F6Fs, picking out fighters from VF-47. "When we spotted 16 American aircraft, the 1st Chutai separated itself from the 2nd and 3rd Chutai in order to gain altitude above the enemy." As Lt Takashi Oshibuchi's 1st Chutai made a climbing turn, his pilots lost sight of the enemy. To make matters worse, poor radio communication meant the 1st Chutai could not contact the rest of the 343rd either.

VF-47's Naval Aviators had first seen the approaching Shiden-Kais when the Japanese fighters dropped their belly tanks, the US pilots immediately calling for reinforcements. The latter took the form of VF-17, which closed on the 11 fighters of

the 2nd Chutai, led by Sento 407th Hikotai CO Lt Yoshishige Hayashi – who was fixated on the VF-47 aircraft ahead of him and wrestling with a drop tank that refused to release. The 2nd Chutai was taken completely by surprise when VF-17 bounced it from behind. Flying his first mission with Sento 407th Hikotai, Hayashi's wingman, nine-victory ace CPO Teigo Ishida, was an early casualty.

Lt Naoshi Kanno's 3rd Chutai, ordered to fly top cover for the 2nd Chutai, soon joined the fray in support of the beleaguered Sento 407th Hikotai. "Lt Kanno and his men dived down to aid the 2nd Chutai," recounted WO Miyazaki. "My division took their place as top cover, some 300m above the combat. After a while Grummans started retreating with damage, but those were only the first group. The second and third groups came to their aid by means of good radar and good radio communications. Once we committed to the battle, my Nos 2 and 4 men, CPO Wataru Tomisugi and PO1c Taro Asama, became separated from my division and lost altitude. Despite having to fend off attacks from Grummans, I tried to offer them assistance. After the combat had ended, I waited for them at the assembly point, but they did not come. I regretted very much that I had lost them due to my poor judgment."

Aside from Tomisugi, Asama and Ishida, the 343rd had lost six more pilots, including the high-scoring hero of March 19, CPO Katsue Katoh. Three F6Fs were claimed as destroyed, but none were actually lost. VF-17 was credited with seven kills and VF-47 claimed no fewer than 22 enemy aircraft destroyed. The mission report by the latter unit read as follows:

Pilots of VF-47 who participated in this air battle came out of it with a tremendous confidence in the F6F-5. They feel that their aircraft offers them tremendous advantages in firepower, armor protection and speed over the Japanese "Zeke," "Tojo" [in reality the N1K2-J] or "Tony." Even the F6Fs that were hit carried their pilots back to base. In contrast, the Jap aircraft burned easily, often broke up when hit and seemed to lack effective firepower when in a good offensive position. Moreover, the F6F-5 easily matches the speed of these Japanese fighters. It is evident, however, that these Jap aircraft can out-turn an F6F.

That same day (April 16), the 343rd Kokutai relocated to Kokubu No. 1 airfield, 25 miles north of Kanoya. The latter site, often packed with suicide aircraft, was proving too crowded for the Shiden-Kai unit. Moreover, it was also being increasingly targeted by USAAF heavy bombers. On April 25, the 343rd moved again, this time to Omura airfield, as Kokubu was now also being continually attacked by US aircraft – it was bombed eight times during the unit's nine-day stay.

The 343rd Kokutai undertook more kamikaze escort missions in early May. On the 4th, Lt Oshibuchi led 36 Shiden-Kais aloft from Omura, bound for Amami-oshima. The fighters passed small groups of slow-moving kamikaze aircraft silhouetted against the sea as they hugged the waves in order to avoid radar detection en route to Okinawa. Lt Goro Ichimura commanded Sento 407th Hikotai on the mission, and he later recalled:



Thirteen-victory ace WO Isamu Miyazaki was among the combat veterans handpicked for service with the 343rd, being sent to Sento 301st Hikotai. He engaged F6Fs several occasions in the final months of the war, including on April 16, 1945 while escorting Tokko aircraft attempting a kamikaze strike on Allied warships off Okinawa. [Author's collection]



A pilot from VF-47 braces himself for the catapult shot from the flight deck of the escort carrier USS *Bataan* (CVL-29) at the start of yet another fleet CAP mission in April 1945. The unit claimed 22 enemy aircraft destroyed on the 16th when it intercepted a large formation of kamikaze airplanes escorted by N1K2-Js. The 343rd lost nine pilots in this one-sided action (which also involved VF-17, which claimed seven kills), including several aces. No Hellcats were lost in return. (Author's collection)

As we arrived in the “killing zone,” the squadron changed course slightly to the left toward the east and came out over the sea east of Amami-oshima. The formation then made a sweeping right turn and flew over Kikaiga Shima, at which point we spotted a dozen Hellcats orbiting.

These aircraft were from VBF-12, embarked in *Randolph*. They had just begun attacking military targets on Kikaiga Shima when the 343rd arrived on the scene. Lt Oshibuchi ordered belly tanks dropped and that Sento 701st Hikotai and Sento 407th Hikotai should follow him down in an attacking pass, while Sento 301st Hikotai provided top cover. Lt Ichimura continued:

The Shiden-Kais spread out to form a fighting formation of two-aircraft sections. Immediately, I changed fuel supply from the drop tank to the main tank, pulling the drop lever hard. At the same time, the engine throttle was opened all the way, the gunsight was switched on and the four 20mm guns were test fired. The combat flaps, of course, had already been charged to automatic. I was ready for combat. My brave wingmen to the right and left were nodding their heads imposingly with oxygen masks on. We were all prepared, only awaiting orders to go in.

Battle quickly ensued, with the IJNAF pilots forming up into two defensive Lufbery circles, from which they would peel off to make an attack and then return. Hellcats from VF-9 soon joined the melee, and a number of N1K2-Js were claimed as shot down. The Shiden-Kai pilots rapidly ran low on fuel, as Lt Ichimura explained:

Time had come for the friendly fighters to form up again, at which point the 16 cover Shiden-Kais joined the fight from above. They dived and drove off the enemy aircraft by using typical formation attack tactics, one-sidedly destroying 12 aircraft. The dreadful attacking power of the Shiden-Kai was exhibited to the fullest. I looked down and saw a group of Special Attack aircraft heading south. I almost felt as if they were roaring forward toward us to thank us. We assembled one after another, worrying about our decreased fuel supply. After sending our farewell greetings to the strike group, who would not be coming back, we set course for Omura.

Although Lt Ichimura believed that the 343rd had dealt a serious blow to the Hellcat units engaged (the kokutai claimed 13 kills), not a single F6F had in fact been downed – four had suffered repairable damage. Six Shiden-Kais failed to make it back to Omura. Again, the US Navy's excellent radio communication had been a key factor in the Hellcat pilots' success, as had their tactics – VBF-12 made "systematic passes from above, out of the sun." Finally, the Naval Aviators were wearing "anti-blackout suits that made maneuvers otherwise impossible, such as continued high-speed turns to be flown with relative ease."

No fewer than 105 Japanese aircraft were credited to US Navy fighters on May 4, but only one was identified as being a "George." This was claimed by future ace Lt Howard Hudson, his victory being mentioned in the VF-9 Aircraft Action Report:

During the time that Hudson and [Lt(jg) William] McLaurin were making photo runs over Kikai Airfield, they heard reports of enemy planes in the area. They spotted a melee between Kikai and Amami, flew in that direction and found a fight going on with 8–10 Georges and Zekes. McLaurin, after making several runs on two enemy fighters, made a high side run on a Zeke at 2,500ft, getting a 30° deflection shot, with hits in the engine and cockpit, destroying the Zeke in the air. The Zeke started to smoke and the engine burst into flame, McLaurin last seeing the plane diving straight for the ground, burning, at 1,500ft.

When McLaurin went to join Hudson he found a George on his tail. The George got a good burst of 20mm into McLaurin's plane, hitting its fuselage, wings and tail, with one shell exploding in the radio gear and another hitting the armor plate behind McLaurin's head. Hudson started a run on the George which then momentarily broke away. Although his plane was badly damaged, McLaurin was able to fly it back and land aboard.

Hudson then engaged this George which first made a head-on run on the F6Fs, shooting under Hudson at McLaurin. Hudson finally worked around onto the George's tail and fired a long burst, hitting his cockpit and engine from 8–7 o'clock level and above. The George started to smoke under the wing and crashed into the water. The two planes then returned home.

Lt Hudson also told VF-9's Intelligence Officer "although the George could turn inside the F6F-5, its superior speed enabled it to stay with the George, despite being pulled to the outside of the turns."

On June 22, US forces secured Okinawa after more than ten weeks of bitter fighting. That same day, the final series of kamikaze raids was mounted on vessels offshore. Just 25 suicide aircraft could be mustered, escorted by 50 Shiden-Kais (the entire airworthy force of the 343rd). No fewer than 19 fighters aborted the mission, however, due to deteriorating servicing and supply problems. The remaining N1K2-J pilots did not encounter any Hellcats during the operation.

## BUNGO STRAIT BATTLE

With Okinawa in Allied hands and Iwo Jima captured in February–March 1945 after a ferocious battle that cost US forces almost 7,000 lives and resulted in the deaths of



A total of 105 Japanese aircraft were credited to US Navy fighter pilots as shot down on May 4, 1945, but only one was identified as being a "George." This was claimed by future ace Lt Howard Hudson of VF-9. (NARA)



more than 18,000 Japanese troops, TF 38 turned its attention to the Home Islands once again. Naval aircraft struck Tokyo, Hokkaido and Honshu between July 10 and 18. At Omura, the 343rd's ability to function effectively was also being steadily reduced as its airfield became the target of a sustained bombing campaign.

The unit's morale was boosted on June 26 by the arrival of legendary ace Ens Kaneyoshi Mutoh, transferred to Sento 301st Hikotai from the Yokosuka Kokutai. His place in the latter unit was taken by fellow high-scoring ace Ens Saburo Sakai, who had been declared unfit for combat. Upon reaching Omura, Mutoh was ordered by Genda to protect Lt Kanno. His score stood at 27 victories when he joined the 343rd.

During the morning of July 24, more than 500 carrier aircraft launched on strikes against Japanese vessels in Kure harbor. Against this mighty force, Genda could send only 24 serviceable Shiden-Kais. He knew his best chance of success was to hit the enemy aircraft as they headed back to their carriers, possibly with flak damage and definitely low on fuel. Shortly after 0900hrs, all three sento hikotai sortied fighters. "At the time, enemy groups of about 30 aircraft each were coming north for attacks on Kure and then going back in long columns," Genda recalled. "Their movements were clearly known to us from the information sent from the air defense network. The only problem was to judge which formation we should attack with our Shiden-Kais. We needed to make a swift retreat after dealing a hard blow before we could be attacked by the next enemy formation."

Lt Oshibuchi, leading the formation, circled around Cape Sata at almost 20,000ft while receiving up-to-the-minute information and instructions from Genda. Oshibuchi eventually headed south into the Bungo Strait, where, according to Lt Ryoichi Yamada, "Groups of enemy aircraft came into view like scattered sesame seeds! Gradually, they became large enough to be identified as enemy aircraft – about 250 of them. They continued to fly south in an orderly fashion as if they did not notice us."

Ordering Sento 301st Hikotai to provide top cover, Oshibuchi then led the remaining pilots in an attack on a group of fighters from USS *Bennington* (CV-20) some 10,000ft below them. "Flying side-by-side with Lt Oshibuchi, I fired a first burst at an enemy aircraft during my first pass," Lt Yamada recalled. "I took my position again and started my second firing pass, seeing Lt Oshibuchi taking his position for his second pass. By this time the enemy formation had lost order. The fight became a melee as soon as the 301st directed its attack on an enemy group that approached in succession." Yamada's wingman, CPO Masamori Ono, added, "As the enemy strength was overwhelming, our favorable position turned unfavorable very quickly, and we fell into a hard fight."

Oshibuchi and fellow ace Ens Kazuo Muranaka were both seen to down an enemy fighter, although the latter soon fell behind his leader due to a loose engine cover. After making three attacking passes, Oshibuchi suffered damage to his engine from a burst of enemy fire. As he and his wingman, CPO Jiro Hatsushima, tried to flee the area, they ran headlong into VF-49's Hellcats, heading back to USS *San Jacinto* (CVL-30). Hatsushima was quickly shot down, and Lt(jg) Jack "Hoot" Gibson closed on Oshibuchi's fighter, which he spotted was marked with two white bands around the fuselage aft of the cockpit – these indicated that the aircraft was flown by a flight leader:

# ENGAGING THE ENEMY



All Shidens and most Shiden-Kais were equipped with the Navy Type 4 reflector gunsight Model 1, fitted immediately behind a pane of bulletproof glass. Based on the German Revi C/12C, the gunsight was officially accepted by the IJNAF in January 1944 and entered series production three months later. A total of 7,280 Model 1, 2 and 3 gunsights were produced, with the latter variants also being installed in late-build N1K2-Js from the spring of 1945. The Model 3 gunsight [featuring adjustable guide lines on the reflector glass and a simple range-estimation device] was developed specifically for use against larger aircraft, and the B-29 in particular.

Although the Shiden-Kai's 20mm cannon was a slow-firing weapon, which meant pilots relying on it required effective gunnery skills, the Type 99 packed a punch. Twelve-victory ace Ens Akio Matsuba – who was one

of the oldest pilots assigned to the 343rd Kokutai – told his CO, Capt Genda, after engaging Hellcats on March 19, 1945 that “the power of the 20mm cannon is enormous. If our range is right the enemy can be knocked out with one burst!”

From US Navy After Action Reports and memoirs of surviving Japanese pilots, it appears that an IJNAF fighter pilot's best chance of downing a Hellcat was to bounce the aircraft from behind and fire from close range at its fuel tanks in the wings [there are several reports of Hellcats going down in flames after being hit here] or other vital areas with the 20mm cannon. In this artwork, a pilot has punctured an F6F-5's vulnerable centerline belly tank with an explosive round in a risky head-on pass that would have exposed his Shiden-Kai to return fire from the Hellcat's battery of six 0.50in. Browning M-2 machine guns.



The Jap tried to turn inside of me, but every time he started a turn I would fire a short burst in front of him that would always bring him back straight and level. I did a lot of hunting before the war and was involved in a lot of deflective shooting, which helped me with aerial gunnery. The estimated range of my opponent was right in the convergence zone of my guns, and where they converged was the lethal zone of machine guns on fixed-wing airplanes. When I got in effective range, my first burst knocked his wheels down, which decreased his speed tremendously. I overran him and had to pull up in a wing over to drop back on his tail. I had to drop my flaps and my landing gear to be able to stay a distance behind him so I could hit him with my machine guns. He then tried skidding turns, without success. By this time, I began to get my bursts in the cockpit and he started to smoke. He fell over on one wing and went straight into the water, without burning.

Lt Takashi Oshibuchi, six-victory ace and senior squadron commander of the 343rd Kokutai, crashed to his death near Mizunoko Shima.

By then, US Navy fighters had engaged all three squadrons in the kokutai. Fellow ace WO Minoru Honda claimed an F6F for his 17th, and last, victory. "I approached an F6F from behind and above," the ace recalled. "When I saw the head of the pilot, I felt a merciful heart but, in reality, I was engaged in a cold-blooded fight, and I fired 20 rounds. The right wing of the enemy aircraft flew off and it went down in a spin."

This success was quickly tempered by the loss of Ens Mutoh, who was last seen fighting with a pair of Corsairs in an attempt to avenge the loss of two pilots from his division. One of his opponents was VBF-1's Lt(jg) Robert M. Applegate, flying from *Bennington*. He too had lost a wingman, Ens Robert Speckmann falling to recently promoted WO Mitsuo Hori. With Applegate now seemingly at the mercy of the Shiden-Kais, he was saved by the timely arrival of two Hellcats from VF-88, embarked in USS *Yorktown* (CV-10). Honda soon downed Lt(jg) Kenneth Meyer's F6F, however, and the remaining Shiden-Kais, bar the aircraft flown by Mutoh, then broke off the fight.

The 343rd lost six pilots, including two aces, during this fiercely fought engagement, while claiming 16 enemy aircraft shot down. TF 38 had lost 28 aircraft, although the majority had fallen to flak over Kure. However, the 343rd had downed at least one Hellcat and three Corsairs.

The action over Bungo Strait on July 24 was the final large-scale clash between the 343rd Kokutai and US Navy F6Fs, although two isolated actions took place on the 25th and 28th. These resulted in two victories for VBF-83 and a single kill for VF-16, the pilots involved stating that they had downed "Georges." Naval Aviators from the latter squadron had also been credited with no fewer than 12 "Franks" shot down during the same action over Ozuki airfield, so this lone N1K2-J may have actually been a Ki-84.

On August 15, Emperor Hirohito's surrender speech was broadcast live over loudspeakers at Omura, Capt Genda having assembled all personnel to listen to the address. Later that same day the 343rd Kokutai's executive officer, Lt Cdr Yoshio Shiga, led all airworthy Shiden-Kais (18 aircraft) on one last flight in the immediate vicinity of Omura.

By war's end, the 343rd Kokutai had claimed more than 170 victories in five months of combat at a cost of 82 pilots killed and 14 wounded. A further 21 aviators had been lost in flying accidents. US forces occupied Omura on September 14, VMF-113 flying its Corsairs in from Okinawa nine days later.



# STATISTICS AND ANALYSIS

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The aerial engagements fought between the Hellcat and the Shiden/Shiden-Kai took place between October 1944 and July 1945, the fighters clashing probably no more than 20 times in total. As previously noted, it is impossible to state with any degree of certainty exactly how often Naval Aviators flying F6F-3/5s encountered their IJNAF counterparts in N1K1/2-Js due to the proliferation of radial-engined Japanese fighter types in the skies over Formosa, the Philippines, the Ryukyu Islands and, finally, the Home Islands. Due to their paucity in number (only 1,007 Shidens and 393 Shiden-Kais were built in 1944/45, compared to 9,718 Hellcats over the same period), it is little wonder that the N1K1/2-J was rarely identified as such in the maelstrom of aerial combat by the hundreds of Hellcat pilots in-theater in the final 11 months of the Pacific War.

Unlike the myriad IJNAF Zero-sen units that proliferated through to VJ-Day, only a handful of kokutais were issued with the Shiden/Shiden-Kai because of poor rates of production and ongoing technical problems with the aircraft. Conversely, the Hellcat was the dominant fighter embarked in US Navy carriers in the Pacific – a position it held throughout 1944 and well into 1945, when growing numbers of F4U Corsairs at last began to appear on flight decks (there were 534 F6F-5s and 303 F4U-1/4s embarked in TF 58 carriers at the start of the Okinawa campaign).

Increasingly aware that the N1K2-J in particular was not going to be available in the numbers it so desperately needed, the IJNAF decided to equip just one frontline unit with the aircraft – the 343rd Kokutai. This duly became an elite kokutai, with a significant number of its pilots being highly experienced combat veterans. This meant

their performance in the handful of actions in which the unit was involved resulted in notable losses inflicted on the enemy. As with US Naval Aviators, the IJNAF “George” pilots grossly overclaimed the number of victories they achieved. This point was explained by leading aviation historian Henry Sakaida in the introduction to his seminal work on the 343rd Kokutai, *Genda’s Blade*, published in 2003 by Classic Publications:

As accurate records of personnel or aircraft losses have been kept on both sides, true figures of the losses are available in most cases only if the opponent squadrons are identified. In the postwar years, aviation historians have revealed that pilots’ victory claims on each side were generally overestimated. The 343rd Kokutai has proved not to be an exception.

The unit claimed 52 aerial victories in the first big melee over Matsuyama on March 19, 1945. In-depth research on all the Aircraft Action Reports of 27 squadrons from TF 58 shows that 321 aircraft flew on the Kure raid. The co-authors [of *Genda’s Blade*] reached a conclusion that a total of eight US fighters were shot down by the 343rd Kokutai, four more were shot to pieces and consigned to the sea upon their return to the carrier, and two were forced to ditch. On the other hand, 63 fighters were claimed shot down by six US Navy/Marine Corps fighter squadrons (80 aircraft) that apparently fought Shiden-Kais, while the 343rd (which sortied more than 60 fighters) lost 15 fighters and 13 pilots to US fighters. The claims and losses for both sides were remarkably similar.

The exaggerated claims can be attributed to mass confusion, poor observation, multiple counting and excitement in the heat of battle. The greatest factor was “tunnel vision.” So intent on scoring a victory, a pilot is totally focused on his prey, oblivious to his comrades also shooting at the same enemy aircraft. Gun camera film and a wingman would further “confirm” such a victory for each pilot!

Although Hellcats were the dominant US carrier fighters in the Pacific throughout 1944, by early 1945, growing numbers of F4U Corsairs had begun to appear on fast carriers (there were 303 F4U-1/4s embarked in TF 58 vessels at the beginning of the Okinawa campaign). VF-83 F6F-5s shared *Essex’s* flight deck with VBF-83 F4U-1Ds, as well as VT-83 TBM-3s and VB-83 SB2C-4s. [NARA]





#### **FAR LEFT**

CO of VF-17 during the unit's 1944–45 combat cruise in *Hornet*, Lt Cdr Marshall Beebe was the squadron's leading ace on deployment, with 10.5 victories. Although he failed to identify any of these kills as "Georges," the "Jack" he claimed on April 12 was almost certainly a 343rd Kokutai N1K2-J. (NARA)

#### **LEFT**

CPO Katsue Katoh, the 343rd Kokutai's top scorer with nine victories (soon revised to four destroyed and a probable) on March 19, 1945, was the ranking Shiden-Kai ace, although the IJNAF never officially recognized his claims. (Author's collection)

It was not always easy to pick the 343rd Kokutai's combat out of the US Aircraft Action Reports. This was because the Shiden-Kai was misidentified by US pilots. The new fighter made its debut during the last period of the war and the Americans were not familiar with it. Shiden-Kais were misidentified as "Jacks," "Franks," "Tojos" or "Zekes." The co-authors were able to determine that they were the 343rd Kokutai's aircraft being mentioned in the reports based on the following – their American-style formation fighting by divisions or sections, the American pilots' observation about their extreme aggressiveness, and recollections from surviving Japanese and American veterans concerning the time, location and circumstances of their engagements.

It is evident that the American pilots reported accurate figures in some encounters against Shiden-Kais, while the Shiden-Kai pilots usually claimed more than they had actually shot down.

Determining just how many N1K1/2-Js fell to Hellcats and vice versa with any degree of precision is, as leading Pacific War historian Edward M. Young put it, "an exercise in frustration due to the problems of aircraft recognition and the paucity of information currently available from the Japanese side." Postwar, the US Navy published *Naval Aviation Combat Statistics – World War II*, which lists all claims against different types of Japanese aircraft from September 1, 1944 to August 15, 1945. This report states that US Navy Hellcats shot down 26 "Georges" during this period, with the bulk of these claimed by VF-9, VF-17 and VBF-17. The historical information available today indicates that a number of encounters with what Hellcats pilots identified as "Franks" and "Tojos" were actually combats with "Georges."

Hellcat losses to the N1K1/2-J are equally difficult to attribute with any degree of certainty, particularly in the absence of accurate Japanese records of claims against the US fighter. As the US Navy's statistical study commented, "the errors in identification which may normally be expected in the action reports results in a decrease of accuracy





WO Minoru Honda was credited with two victories (one of them an F6F) in the Shiden-Kai, which took his overall tally to 17. Prior to joining the 343rd he had seen combat over New Guinea, the Solomons and the Philippines with Sento 407th Hikotai. He helped his hikotai leader, Lt Hayashi, rebuild the latter unit following its return to Japan after the fall of the Philippines, remaining with the sento hikotai when it became part of the 343rd. [Author's collection]

which leaves something to be desired, but permits comparisons which are believed to be sufficiently near the truth to be of considerable value and interest, and are in any event the best available.”

There were some stunning claims made by Shiden and Shiden-Kai pilots following aerial actions with F6Fs, starting with Sento 401st Hikotai pilots PO1cs Takeo Yamada and Hideo Hirakawa, who were credited with eight Hellcats destroyed between them over Formosa on October 12, 1944. Ens Akio Matsuba of Sento 701st Hikotai also enjoyed early success against the Hellcat with the Shiden, claiming four destroyed off Taiwan and over the Philippines. The first pilot to achieve notable success against the F6F while at the controls of a Shiden-Kai was veteran ace Ens Kaneyoshi Mutoh of the Yokosuka Kokutai. He claimed to have destroyed four examples on February 16, 1945 over Honshu. On March 19, the 343rd Kokutai engaged Hellcats for the first time in a series of swirling dogfights, and upon returning to base, CPO Katsue Katoh claimed nine F6Fs destroyed – this tally was quickly revised to four destroyed and a probable. Fellow Sento 301st Hikotai ace CPO Shoichi Sugita downed three Grumman fighters during the same mission. The kokutai claimed 20 Hellcats and three Corsairs destroyed on April 12, when in reality only one F6F-5 and an FG-1D had been downed.

For the US Navy Hellcat pilots, the “George” was just one of many Japanese fighters they encountered in battles over Formosa, the Philippines, Kyushu and Okinawa. They were far more likely to engage the similar-looking “Zeke.” Given the intensity of the

fighting in these theaters and the relatively few identifiable encounters between the Hellcat and the “George,” spread over a handful of US Navy fighter squadrons, not to mention the positive outcome of almost all these combats, it is unsurprising that the Shiden and Shiden-Kai did not make a lasting impact on the F6F pilots that dueled with them at close quarters.

Although the superior performance of the N1K1/2-J improved the odds of success and survival for all pilots regardless of their level of experience, the introduction of the Shiden/Shiden-Kai during the defense of Japan did little to alter the outcome of the battle. In the duels between the Hellcat and the “George,” the F6F usually prevailed, although it was not without effort. Fortunately for US Navy pilots, the Kawanishi fighters were too few in number to significantly alter the outcome of the aerial battles waged against vast formations of US carrier-based airplanes flown by better-trained pilots.

It is interesting to note that the victory-to-loss ratio of the Hellcat against the later models of Japanese fighters (the N1J1/2 Shiden and Shiden-Kai, the J2M Raiden and the Ki-84 Hayate) was 8.5-to-1 – still in the Hellcat’s favor, but a lower ratio than against the Zero-sen, which was 13-to-1 in the final year of the war. Had these later Japanese fighters been flown in greater numbers by pilots with more training and better tactics, the ratio might well have been worse.

# AFTERMATH

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The N1K1/2-Js' combat career ended abruptly following the unconditional surrender of Japan on August 15, 1945. When US forces occupied Omura, in southern Kyushu, on September 14, they found no fewer than 80 343rd Kokutai N1K2-Js. In accordance with the surrender directives, their propellers and spinners had been carefully removed, rendering them non-airworthy.

In October six were restored to airworthiness and flown by former IJNAF pilots (including Lt Cdr Yoshio Shiga) to test their suitability for shipping to the USA for further evaluation. The three examples deemed to be in the best mechanical condition were eventually flown to Yokosuka on October 16, 1945, having been fitted with drop tanks for the ferry flight. Flown by IJNAF pilots, again including Shiga, the "Georges" were escorted by four FG-1D Corsairs from VMF-113, which was based at Omura. Devoid of ammunition and running on high octane US aviation fuel, the N1K2-Js easily outpaced the escorting Corsairs, whose pilots had orders to shoot the Japanese fighters down if they deviated from straight and level flight.

It would appear that as many as six Shiden-Kais were eventually shipped to the USA from Yokosuka, near Tokyo, sprayed with an anti-corrosion coating to protect them from sea water and loaded on board the escort carrier USS *Barnes* (CVE-20). Once in the USA, the aircraft were split evenly between the US Navy and USAAF, and briefly test flown. The fighter was found to possess "excellent" performance qualities, specifically for dogfighting. Although all three "Georges" assigned to the US Navy were destroyed as targets at Naval Proving Ground Dahlgren Junction, Virginia, in late 1946, the three USAF fighters survived to become museum exhibits.

The N1K1-J Shiden had also been test flown by USAAF and US Navy pilots, since a number were captured when US Army troops liberated the Clark Field complex in February 1945. The TAIU-SWPA restored at least two to airworthiness and briefly

test flew them during April. One was damaged beyond repair when the undercarriage collapsed at the end of its first evaluation flight. The second, which had belonged to the 341st Kokutai, successfully completed a handful of flights. During testing at Clark Field, the fighter's underwing cannon gondolas and nose-mounted machine guns were removed to give the N1K1-J similar performance to the more advanced N1K2-J. The aircraft was eventually scrapped at Clark Field.

A fierier fate befell the 70 surviving N1K2-Js that remained at Omura on December 30, 1945. The destruction methods employed by the occupation forces when disposing of Japanese aircraft were detailed in the following account from an unidentified officer serving with the US Army's XI Corps Artillery at "Mito-Two":

More than 1,500 Japanese aircraft have been destroyed during the past 12 days by men of the 637th Tank Destroyer Battalion, which is located just northeast of Tokyo. Moving in on 12 airfields, and covering a ground area of 800 square miles, these men have organized into what they call "Destruction Incorporated" crews. A crew consists of five men, a Japanese full track prime mover and a gas pump spray mounted on a Japanese truck. The system for destruction is simple, but believed to be foolproof. Two men on the prime mover pull the planes to the selected burning area. One man searches the entire plane for bombs and ammunition. Another member punctures all gas tanks to prevent explosion. The remaining man stands by the gas pump spray and at the signal "all clear" sprays Japanese synthetic gas over the plane to be destroyed. It is then ignited and the crew moves on to the next aircraft.

Although the Hellcat was the dominant US Navy fighter when the Pacific War ended, it was rapidly replaced in fleet service postwar by F4U-4 Corsairs and F8F Bearcats – Grumman developed the latter specifically as an F6F replacement. The Hellcat remained in production until November 1945, by which time 12,275 had been built, and F6F-5s and F6F-5Ns soldiered on with US Navy and US Marine

When US forces occupied Omura, southern Kyushu, on September 14, 1945, they found 80 343rd Kokutai N1K2-Js. The following month, six were restored to airworthiness and flown, following the addition of US insignia, by former IJNAF pilots to test their suitability for shipping to the US for further evaluation. The examples deemed to be in the best mechanical condition were eventually flown to Yokosuka on October 16. (Author's collection)







More than 70 343rd Kokutai N1K2 Shiden-Kais burn at Omura on December 30, 1945. Except for a few machines preserved for technical air intelligence purposes, all Japanese aircraft captured in the Home Islands had been destroyed by early 1946. (NARA)

Corps Reserve squadrons into the early 1950s. The aircraft also found employment with advanced flying training units until the spring of 1956, while F6F-5D/K target drones continued to support missile tests until May 1963.

Drone Hellcats had in fact seen combat during the Korean War, when Guided Missile Unit 90 launched six explosive-laden F6F-5Ks against North Korean targets from the aircraft carrier USS *Boxer* (CV-21). Armed with a 2,000lb bomb and guided by an escorting AD Skyraider, the first drone Hellcat was launched on August 28, 1952 against a heavily defended bridge.

Armed with a 2,000lb bomb on its centerline rack, a pilotless Guided Missile Unit 90 F6F-5K drone is readied for launch from USS *Boxer* (CV-21) for a one-way mission against a North Korean bridge on August 28, 1952. An AD Skyraider guided the veteran Hellcat to the target. (US Navy)



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## Dedication

This book is dedicated to the memory of Henry Sakaida, who sadly passed away during the course of its production. A leading historian in the field of Japanese wartime aviation, his readiness to help fellow writers was greatly appreciated by all those who worked with him.

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## F6F Hellcat cover art

At 0908hrs on April 7, 1945, four F6F-5s from VF-82 took off from USS *Bennington* (CV-20) on a radar picket combat air patrol of the waters north of Okinawa, the aircraft being charged with defending Allied warships involved in Operation *Iceberg* from deadly kamikaze attacks. The fighters orbited uneventfully until they received a contact vector from a US Navy radar picket destroyer at 1045hrs. Ten minutes later, two “Franks” (almost certainly N1K2-J “Georges” – the radial-engined IJNAF fighter was routinely misidentified in air combat, and the IJNAF and JAAF never flew mixed formations) and a “George” were spotted at an altitude of 200–300ft some 40 miles from the main carrier force. According to the Aircraft Action Report submitted by VF-82 following this mission, the enemy fighters “were making about 200 knots IAS [indicated air speed] and none offered any return fire. The George exploded when hit in the engine and cockpit by Lt A. G. Manson.” Hailing from Buffalo, New York, Lt Armand “Swede” Manson “made ace” five days later. (Cover artwork by Gareth Hector)

## N1K2-J Shiden-Kai cover art

During the early afternoon of April 12, 1945, Lt Masaji Matsumura was forced to fight for his life when set upon by Hellcats from VF-17 and VBF-17 while trying to defend Wan airfield, on Kikaiga-shima island, from aerial attack. Despite being involved in his first dogfight, and with his empty belly tank resisting all attempts made to jettison it, Matsumura had managed to claim a Hellcat destroyed before he was “surrounded” by more F6Fs. Alarmed by tracer rounds whizzing past his cockpit, he made full use of the Shiden-Kai's highly effective combat flaps to reef his fighter into two tight turns before escaping into clouds. Matsumura and three other pilots from his unit subsequently made emergency landings on a small airstrip on Tanega-shima – an island a few miles off the southern coast of Kyushu – when they ran low on fuel. Here, Matsumura's N1K2-J was damaged in a strafing attack by a lone US Navy fighter, and he was forced to return home in a war-weary Zero-sen. (Cover artwork by Gareth Hector)

## Title page

Sento 301st Hikotai pilots pose for a formal photograph at Matsuyama in January 1945, with 343rd Kokutai CO Capt Minoru Genda and his XO, Lt Cdr Yoshio Shiga, seated fourth and fifth from the left in the front row. All squadrons within the 343rd Kokutai were composed of approximately 40 pilots. (Author's collection)